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**SEMEN**

**Semen**, also called **seminal fluid**, [fluid](https://www.britannica.com/science/fluid-physics) that is emitted from the male reproductive tract and that contains [sperm](https://www.britannica.com/science/sperm) cells, which are capable of fertilizing the female eggs. Semen also contains other liquids, known as [seminal plasma](https://www.britannica.com/science/seminal-plasma), which help to keep the sperm cells viable.

In the sexually mature human male, sperm cells are produced by the testes (singular, testis); they [constitute](https://www.merriam-webster.com/dictionary/constitute) only about 2 to 5 percent of the total semen volume. As sperm travel through the male reproductive tract, they are bathed in fluids produced and secreted by the various tubules and glands of the reproductive system. After emerging from the testes, sperm are stored in the [epididymis](https://www.britannica.com/science/epididyme), in which secretions of potassium, sodium, and glycerylphosphorylcholine (an energy source for sperm) are contributed to the sperm cells. Sperm mature in the epididymis. They then pass through a long tube, called the [ductus deferens](https://www.britannica.com/science/ductus-deferens), or vas deferens, to another storage area, the [ampulla](https://www.britannica.com/science/ampulla-anatomy). The ampulla secretes a yellowish fluid, ergothioneine, a substance that reduces (removes oxygen from) chemical [compounds](https://www.merriam-webster.com/dictionary/compounds), and the ampulla also secretes fructose, a sugar that nourishes the sperm. During the process of [ejaculation](https://www.britannica.com/science/ejaculation), liquids from the prostate gland and [seminal vesicles](https://www.britannica.com/science/seminal-vesicle) are added, which help dilute the concentration of sperm and provide a suitable [environment](https://www.merriam-webster.com/dictionary/environment) for them. Fluids contributed by the [seminal](https://www.merriam-webster.com/dictionary/seminal) vesicles are approximately 60 percent of the total semen volume; these fluids contain [fructose](https://www.britannica.com/science/fructose), amino acids, citric acid, [phosphorus](https://www.britannica.com/science/phosphorus-chemical-element), potassium, and [hormones](https://www.britannica.com/science/hormone) known as [prostaglandins](https://www.britannica.com/science/prostaglandin). The [prostate gland](https://www.britannica.com/science/prostate-gland) contributes about 30 percent of the seminal fluid; the [constituents](https://www.merriam-webster.com/dictionary/constituents) of its secretions are mainly [citric acid](https://www.britannica.com/science/citric-acid), acid phosphatase, [calcium](https://www.britannica.com/science/calcium), [sodium](https://www.britannica.com/science/sodium), [zinc](https://www.britannica.com/science/zinc), [potassium](https://www.britannica.com/science/potassium), [protein](https://www.britannica.com/science/protein)-splitting enzymes, and fibrolysin (an [enzyme](https://www.britannica.com/science/enzyme) that reduces [blood](https://www.britannica.com/science/blood-biochemistry) and tissue fibres). A small amount of fluid is secreted by the [bulbourethral](https://www.britannica.com/science/bulbourethral-gland) and [urethral glands](https://www.britannica.com/science/urethral-gland); this is a thick, clear, lubricating protein commonly known as [mucus](https://www.britannica.com/science/mucus).

Essential to sperm motility (self-movement) are small quantities of potassium and [magnesium](https://www.britannica.com/science/magnesium), the presence of adequate amounts of [oxygen](https://www.britannica.com/science/oxygen) in the plasma, proper temperature, and a slightly alkaline pH of 7 to 7.5. Sulfate chemicals in semen help prevent the sperm cells from swelling; and fructose is the main nutrient to sperm cells. The total volume of semen for each ejaculation of a human male averages between 2 and 5 ml (0.12 to 0.31 cubic inch); in stallions the average ejaculate is about 125 ml (7.63 cubic inches). In human beings each ejaculation contains normally 200 to 300 million sperm. Semen frequently contains degenerated cells sloughed off from the network of tubules and ducts through which the semen has passed.

**Fertilization**

Depending on the [species](https://en.wikipedia.org/wiki/Species), spermatozoa can fertilize ova externally or internally. In [external fertilization](https://en.wikipedia.org/wiki/External_fertilization), the spermatozoa fertilize the ova directly, outside of the female's sexual organs. Female [fish](https://en.wikipedia.org/wiki/Fish), for example, [spawn](https://en.wikipedia.org/wiki/Spawn_(biology)) ova into their aquatic environment, where they are fertilized by the semen of the male fish.

During [internal fertilization](https://en.wikipedia.org/wiki/Internal_fertilization), however, fertilization occurs inside the female's sexual organs. Internal fertilization takes place after [insemination](https://en.wikipedia.org/wiki/Insemination) of a female by a male through [copulation](https://en.wikipedia.org/wiki/Copulation_(zoology)). In most [vertebrates](https://en.wikipedia.org/wiki/Vertebrate), including [amphibians](https://en.wikipedia.org/wiki/Amphibian), [reptiles](https://en.wikipedia.org/wiki/Reptile), [birds](https://en.wikipedia.org/wiki/Bird) and [monotreme](https://en.wikipedia.org/wiki/Monotreme" \o "Monotreme) mammals, copulation is achieved through the physical mating of the [cloaca](https://en.wikipedia.org/wiki/Cloaca) of the male and female.[[1]](https://en.wikipedia.org/wiki/Semen#cite_note-Lombardi2012-1) In [marsupial](https://en.wikipedia.org/wiki/Marsupial) and [placental mammals](https://en.wikipedia.org/wiki/Placentalia), copulation occurs through the [vagina](https://en.wikipedia.org/wiki/Vagina).

#### Appearance and consistency

Semen is typically translucent with white, grey or even yellowish tint. Blood in the semen can cause a pink or reddish colour, known as [hematospermia](https://en.wikipedia.org/wiki/Hematospermia), and may indicate a medical problem which should be evaluated by a doctor if the symptom persists.

After ejaculation, the latter part of the ejaculated semen [coagulates](https://en.wikipedia.org/wiki/Coagulation) immediately, forming globules, while the earlier part of the ejaculate typically does not. After a period typically ranging from 15 – 30 minutes, [prostate-specific antigen](https://en.wikipedia.org/wiki/Prostate-specific_antigen) present in the semen causes the decoagulation of the seminal coagulum. It is postulated that the initial clotting helps keep the semen in the vagina, while [liquefaction](https://en.wikipedia.org/wiki/Liquification) frees the sperm to make their journey to the ova.

A 2005 review found that the average reported viscosity of human semen in the literature was 3–7 cP.

### Quality

Main article: [Semen quality](https://en.wikipedia.org/wiki/Semen_quality)

Semen quality is a measure of the ability of semen to accomplish fertilization. Thus, it is a measure of fertility in a man. It is the sperm in the semen that is the fertile component, and therefore semen quality involves both sperm quantity and sperm quality.

### Quantity

The volume of semen ejaculate varies but is generally about 1 teaspoonful or less. A review of 30 studies concluded that the average was around 3.4 milliliters (mL), with some studies finding amounts as high as 5.0 mL or as low as 2.3 mL. In a study with Swedish and Danish men, a prolonged interval between [ejaculations](https://en.wikipedia.org/wiki/Ejaculations) caused an increase of the sperm count in the semen but not an increase of its amount.

#### Increasing semen volume

Some [dietary supplements](https://en.wikipedia.org/wiki/Dietary_supplement) have been marketed with claims to increase seminal volume. Like other supplements, including so-called [herbal viagra](https://en.wikipedia.org/wiki/Herbal_viagra), these are not approved or regulated by the [Food and Drug Administration](https://en.wikipedia.org/wiki/Food_and_Drug_Administration) (as licensed medications would be), and none of the claims have been scientifically verified. Similar claims are made about traditional [aphrodisiac](https://en.wikipedia.org/wiki/Aphrodisiac) foods, with an equal lack of verification.

### Storage

Semen can be stored in diluents such as the Illini Variable Temperature (IVT) diluent, which have been reported to be able to preserve high fertility of semen for over seven days. The IVT diluent is composed of several salts, sugars and antibacterial agents and gassed with [CO2](https://en.wikipedia.org/wiki/Carbon_dioxide).

[Semen cryopreservation](https://en.wikipedia.org/wiki/Semen_cryopreservation) can be used for far longer storage durations. For human sperm, the longest reported successful storage with this method is 21 years.

## Health

### Disease transmission

Semen can transmit many [sexually transmitted diseases](https://en.wikipedia.org/wiki/Sexually_transmitted_diseases) and [pathogens](https://en.wikipedia.org/wiki/Pathogen), including viruses like [HIV](https://en.wikipedia.org/wiki/HIV) and [Ebola](https://en.wikipedia.org/wiki/Ebola). Swallowing semen carries no additional risk other than those inherent in [fellatio](https://en.wikipedia.org/wiki/Fellatio). This includes transmission risk for [sexually transmitted diseases](https://en.wikipedia.org/wiki/Sexually_transmitted_disease) such as [human papillomavirus](https://en.wikipedia.org/wiki/Human_papillomavirus) (HPV) or [herpes](https://en.wikipedia.org/wiki/Herpes), especially for people with bleeding gums, gingivitis or open sores. Viruses in semen survive for a long time once outside the body.

### Blood in semen (hematospermia)

Main article: [Hematospermia](https://en.wikipedia.org/wiki/Hematospermia)

The presence of blood in semen or [hematospermia](https://en.wikipedia.org/wiki/Hematospermia) may be undetectable (it can only be seen microscopically) or visible in the fluid. Its cause could be the result of [inflammation](https://en.wikipedia.org/wiki/Inflammation), [infection](https://en.wikipedia.org/wiki/Infection), blockage, or injury of the male reproductive tract or a problem within the [urethra](https://en.wikipedia.org/wiki/Urethra), [testicles](https://en.wikipedia.org/wiki/Testicles), [epididymis](https://en.wikipedia.org/wiki/Epididymis) or [prostate](https://en.wikipedia.org/wiki/Prostate). It usually clears up without treatment, or with [antibiotics](https://en.wikipedia.org/wiki/Antibiotics), but if persistent further [semen analysis](https://en.wikipedia.org/wiki/Semen_analysis) and other [urogenital system](https://en.wikipedia.org/wiki/Urogenital) tests might be needed to find out the cause.

### Semen allergy

In rare circumstances, humans can develop an allergy to semen, called human seminal plasma sensitivity. It appears as a typical localized or systemic [allergic response](https://en.wikipedia.org/wiki/Allergic_response) upon contact with seminal fluid. There is no one protein in semen responsible for the reaction. Symptoms can appear after first intercourse or after subsequent intercourse. A semen allergy can be distinguished from a latex allergy by determining if the symptoms disappear with use of a [condom](https://en.wikipedia.org/wiki/Condom). Desensitization treatments are often very successful.

### Benefits to females

Females may benefit from absorbing seminal fluid. Such benefits include male insects transferring nutrients to females via their ejaculate; in both humans and bovines, the fluid has antiviral and antibacterial properties; and useful bacteria such as [Lactobacillus](https://en.wikipedia.org/wiki/Lactobacillus) have been detected in fluid transferred from birds and mammals.

**MALE ORGASM**

The male orgasm is a complex experience. The major function of the male orgasm is to [ejaculate](https://www.verywellhealth.com/facts-about-ejaculation-ejaculate-2329073) sperm, although not all men will ejaculate during an orgasm. Beyond delivering pleasure, the role of the female orgasm is less clear, although it may help move the sperm closer toward the ovum (egg).

The male orgasm is a complex system involving multiple hormones, organs, and nerve pathways.

The hormone testosterone, produced in the testicles, plays a central role by enhancing the sexual desire (libido) that leads to arousal, erection, and ultimately orgasm. By contrast, low testosterone not only decreases a man's energy and mood, it makes him less responsive to sexual stimuli, both physical and mental.1﻿

With that being said, a man often only requires physical stimulation to achieve arousal, while women typically need physical and mental stimulation to achieve the same.

Men differ from women in that their orgasms—the climax of the sexual response—come on faster and are shorter than women's. By and large, the male orgasm will last for five to 10 seconds. Women will last 10 to 15 seconds on average, although some have reported orgasms that last as long as a minute (a virtual impossibility for men).

The male ejaculate, [semen](https://www.verywellhealth.com/facts-about-semen-an-indication-of-health-status-2328524), is comprised of sperm cells and seminal fluid, the latter of which contains phosphorylcholine (an enzyme that aids in fertility) and fructose (which provides fuel for sperm). The average volume of semen expelled by a healthy man is around a teaspoon.

## 4 Phases of the Male Orgasm

The sexual response cycle has four phases: desire (libido), arousal (excitement), orgasm and resolution. Both men and women experience these phases, although the timing usually is different. For example, it is unlikely that both partners will reach orgasm at the same time. In addition, the intensity of the response and the time spent in each phase varies from person to person. Many women will not go through the sexual phases in this order. Some of these stages may be absent during some sexual encounters, or out of sequence in others. A desire for intimacy may be a motivation for sexual activity in some individuals.

##### Phase 1: Desire

General characteristics of this phase, which can last from a few minutes to several hours, include the following:

* Muscle tension increases.
* Heart rate quickens and breathing is accelerated.
* Skin may become flushed (blotches of redness appear on the chest and back).
* Nipples become hardened or erect.
* Blood flow to the genitals increases, resulting in swelling of the [woman’s](https://my.clevelandclinic.org/health/articles/9118-female-reproductive-system) clitoris and labia minora (inner lips), and erection of the [man’s](https://my.clevelandclinic.org/health/articles/9117-male-reproductive-system) penis.
* Vaginal lubrication begins.
* The woman’s breasts become fuller and the vaginal walls begin to swell.
* The man’s testicles swell, his scrotum tightens, and he begins secreting a lubricating liquid.

##### Phase 2: Arousal

General characteristics of this phase, which extends to the brink of orgasm, include the following:

* The changes begun in phase 1 are intensified.
* The vagina continues to swell from increased blood flow, and the vaginal walls turn a dark purple.
* The woman’s clitoris becomes highly sensitive (may even be painful to touch) and retracts under the clitoral hood to avoid direct stimulation from the penis.
* The man’s testicles are withdrawn up into the scrotum.
* Breathing, heart rate and blood pressure continue to increase.
* [Muscle spasms](https://my.clevelandclinic.org/health/diseases/15466-muscle-spasms) may begin in the feet, face and hands.
* Tension in the muscles increases.

##### Phase 3: Orgasm

This phase is the climax of the sexual response cycle. It is the shortest of the phases and generally lasts only a few seconds. General characteristics of this phase include the following:

* Involuntary muscle contractions begin.
* Blood pressure, heart rate and breathing are at their highest rates, with a rapid intake of oxygen.
* Muscles in the feet spasm.
* There is a sudden, forceful release of sexual tension.
* In women, the muscles of the vagina contract. The uterus also undergoes rhythmic contractions.
* In men, rhythmic contractions of the muscles at the base of the penis result in the ejaculation of semen.
* A rash or "sex flush" may appear over the entire body.

##### Phase 4: Resolution

During this phase, the body slowly returns to its normal level of functioning, and swelled and erect body parts return to their previous size and color. This phase is marked by a general sense of well-being and, often, fatigue. Some women are capable of a rapid return to the orgasm phase with further sexual stimulation and may experience multiple orgasms. Men need recovery time after orgasm, called a refractory period, during which they cannot reach orgasm again. The duration of the refractory period varies among men and changes with age.