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**Write a short note on the following:**

* **Male infertility**
* **semen**

Male infertility refers to a males in ability to cause pregnancy in a female. In humans, it accunts for 40-50% of infertility.it affects approximately 7% of all men. Male infertility is commonly due to deficiencies in the semen, and semen quality is used as a surrogate measure of male fecundity.

Cause

Factors relating to male infertility include:

**Immune infertility**

[Antisperm antibodies](https://en.wikipedia.org/wiki/Antisperm_antibodies) (ASA) have been considered as infertility cause in around 10–30% of infertile couples. ASA production are directed against surface antigens on sperm, which can interfere with sperm motility and transport through the female reproductive tract, inhibiting capacitation and [acrosome reaction](https://en.wikipedia.org/wiki/Acrosome_reaction), impaired [fertilization](https://en.wikipedia.org/wiki/Fertilisation), influence on the implantation process, and impaired growth and development of the [embryo](https://en.wikipedia.org/wiki/Embryo). Risk factors for the formation of antisperm antibodies in men include the breakdown of the blood‑testis barrier, trauma and surgery, orchitis, [varicocele](https://en.wikipedia.org/wiki/Varicocele%22%20%5Co%20%22Varicocele), infections, [prostatitis](https://en.wikipedia.org/wiki/Prostatitis), [testicular cancer](https://en.wikipedia.org/wiki/Testicular_cancer), failure of immunosuppression and unprotected receptive anal or oral sex with men.

**Genetics**

Chromosomal anomalies and genetic mutations account for nearly 10–15% of all male infertility cases.

**Klinefelter Syndrome**

One of the most commonly known causes of infertility is [Klinefelter Syndrome](https://en.wikipedia.org/wiki/Klinefelter_Syndrome%22%20%5Co%20%22Klinefelter%20Syndrome), affecting 1 out of 500–1000 newborn males Klinefelter Syndrome is a chromosomal defect that occurs during gamete formation due to a non-disjunction error during cell division. Resulting in males having smaller testes, reducing the amount of testosterone and sperm production. Males with this syndrome carry an extra X chromosome (XXY), meaning they have 47 chromosomes compared to the normal 46 in each cell. This extra chromosome directly affects sexual development before birth and during puberty (links to learning disabilities and speech development have also been shown to be affected). There are varieties in Klinefelter Syndrome, where some cases may have the extra X chromosome in some cells but not others, referred to as Mosaic Klinefelter Syndrome, or where individuals have the extra X chromosome in all cells. The reduction of testosterone in the male body normally results in an overall decrease in the production of viable sperm for these individuals thereby forcing them to turn to fertility treatments to father children.

**Y chromosome deletions**

[Y chromosomal infertility](https://en.wikipedia.org/wiki/Y_chromosome_deletions) is a direct cause of male infertility due to its effects on sperm production, occurring in 1 out of every 2000 males. Usually affected men show no sign of symptoms other than at times can exhibit smaller teste size. Men with this condition can exhibit [azoospermia](https://en.wikipedia.org/wiki/Azoospermia%22%20%5Co%20%22Azoospermia) (no sperm production), [oligozoospermia](https://en.wikipedia.org/wiki/Oligozoospermia%22%20%5Co%20%22Oligozoospermia) (small number of sperm production), or they will produce abnormally shaped sperm (teratozoospermia). This case of infertility occurs during the development of gametes in the male, where a normal healthy male will produce both X and a Y chromosome, affected males have genetic deletions in the Y chromosome. These deletions affect protein production that is vital for [spermatogenesis](https://en.wikipedia.org/wiki/Spermatogenesis). Studies have shown that this is an inherited trait; if a male is fathered by a man who also exhibited y chromosome deletions then this trait will be passed down. These individuals are thereby “Y-linked”, although daughters are not affected due to the lack of the Y chromosome.

Diagnosis

The diagnosis of infertility begins with a medical history and physical exam by a [physician](https://en.wikipedia.org/wiki/Physician), [physician assistant](https://en.wikipedia.org/wiki/Physician_assistant), or [nurse practitioner](https://en.wikipedia.org/wiki/Nurse_practitioner). Typically two separate [semen analyses](https://en.wikipedia.org/wiki/Semen_analysis) will be required. The provider may order blood tests to look for hormone imbalances, medical conditions, or genetic issues.

**Medical history**

The history should include prior testicular or penile insults ([torsion](https://en.wikipedia.org/wiki/Testicular_torsion), [cryptorchidism](https://en.wikipedia.org/wiki/Cryptorchidism), [trauma](https://en.wikipedia.org/wiki/Physical_trauma)), [infections](https://en.wikipedia.org/wiki/Infections) ([mumps](https://en.wikipedia.org/wiki/Mumps) [orchitis](https://en.wikipedia.org/wiki/Orchitis), [epididymitis](https://en.wikipedia.org/wiki/Epididymitis)), environmental factors, excessive heat, [radiation](https://en.wikipedia.org/wiki/Radiation), medications, and drug use ([anabolic steroids](https://en.wikipedia.org/wiki/Anabolic_steroids), [alcohol](https://en.wikipedia.org/wiki/Alcohol_%28drug%29), [smoking](https://en.wikipedia.org/wiki/Smoking)).

Sexual habits, frequency and timing of intercourse, use of [lubricants](https://en.wikipedia.org/wiki/Lubricant), and each partner's previous fertility experiences are important.

Loss of [libido](https://en.wikipedia.org/wiki/Libido) and [headaches](https://en.wikipedia.org/wiki/Headaches) or [visual disturbances](https://en.wikipedia.org/wiki/Visual_disturbances) may indicate a [pituitary tumor](https://en.wikipedia.org/wiki/Pituitary_tumor).

The past medical or surgical history may reveal thyroid or liver disease (abnormalities of spermatogenesis), [diabetic neuropathy](https://en.wikipedia.org/wiki/Diabetic_neuropathy) ([retrograde ejaculation](https://en.wikipedia.org/wiki/Retrograde_ejaculation)), radical pelvic or [retroperitoneal](https://en.wikipedia.org/wiki/Retroperitoneal) surgery (absent seminal emission secondary to sympathetic nerve injury), or [hernia repair](https://en.wikipedia.org/wiki/Hernia_repair) (damage to the vas deferens or testicular blood supply).

A [family history](https://en.wikipedia.org/wiki/Family_history) may reveal genetic problems.

**Physical examination**

Usually, the patient disrobes completely and puts on a gown. The physician, physician assistant, or nurse practitioner will perform a thorough examination of the [penis](https://en.wikipedia.org/wiki/Human_penis), [scrotum](https://en.wikipedia.org/wiki/Scrotum), [testicles](https://en.wikipedia.org/wiki/Testicles), I [vas deferens](https://en.wikipedia.org/wiki/Vas_deferens), [spermatic cords](https://en.wikipedia.org/wiki/Spermatic_cord), [ejaculatory ducts](https://en.wikipedia.org/wiki/Ejaculatory_ducts), [urethra](https://en.wikipedia.org/wiki/Urethra), [urinary bladder](https://en.wikipedia.org/wiki/Urinary_bladder), [anus](https://en.wikipedia.org/wiki/Anus) and [rectum](https://en.wikipedia.org/wiki/Rectum). An [orchidometer](https://en.wikipedia.org/wiki/Orchidometer%22%20%5Co%20%22Orchidometer) can measure testicular volume, which in turn is tightly associated with both sperm and hormonal parameters. A physical exam of the scrotum can reveal a [varicocele](https://en.wikipedia.org/wiki/Varicocele%22%20%5Co%20%22Varicocele), but the impact of detecting and surgically correct a varicocele on sperm parameters or overall male fertility is debated.

**Sperm sample**

**Semen sample obtaining**

Semen sample obtaining is the first step in spermiogram. The optimal sexual abstinence for semen sample obtaining is of 2–7 days. The first way to obtain the semen sample is through masturbation, and the best place to obtain it is in the same clinic, as this way temperature changes during transport can be avoided, which can be lethal for some spermatozoa.

A single semen sample is not determining for disease diagnosis, so two different samples have to be analyzed with an interval between them of seven days to three months, as sperm production is a cyclic process. It is prudent to ask about possible sample loss, as that could mask true results of spermiogram.

To obtain the sample, a sterile plastic recipient is put directly inside, always no more than one hour before being studied. Conventional preservatives shouldn't be used, as they have chemical substances as lubricants or spermicides that could damage the sample. If preservatives have to be used, for cases of religious ethics in which masturbation is forbidden, a preservative with holes is used. In case of paraplegia it is possible to use mechanic tools or [electroejaculation](https://en.wikipedia.org/wiki/Electroejaculation%22%20%5Co%20%22Electroejaculation).

The sample should never be obtained through coitus interruptus for several reasons:

* Some part of ejaculation could be lost.
* Bacterial contamination could happen.
* The acid vaginal pH could be deleterious for sperm motility.

Prevention

Some strategies suggested or proposed for avoiding male infertility include the following:

* Avoiding [smoking](https://en.wikipedia.org/wiki/Smoking) as it damages sperm DNA
* Avoiding heavy [marijuana](https://en.wikipedia.org/wiki/Marijuana) and [alcohol](https://en.wikipedia.org/wiki/Alcohol_%28drug%29) use.
* Avoiding excessive heat to the testes.
* Maintaining optimal frequency of coital activity: sperm counts can be depressed by daily coital activity and sperm motility may be depressed by coital activity that takes place too infrequently (abstinence 10–14 days or more).
* Wearing a [protective cup](https://en.wikipedia.org/wiki/Protective_cup) and [jockstrap](https://en.wikipedia.org/wiki/Jockstrap) to protect the testicles, in any sport such as [baseball](https://en.wikipedia.org/wiki/Baseball), [football](https://en.wikipedia.org/wiki/Football), [cricket](https://en.wikipedia.org/wiki/Cricket), [lacrosse](https://en.wikipedia.org/wiki/Lacrosse), [hockey](https://en.wikipedia.org/wiki/Hockey), [softball](https://en.wikipedia.org/wiki/Softball), [paintball](https://en.wikipedia.org/wiki/Paintball), [rodeo](https://en.wikipedia.org/wiki/Rodeo), [motorcross](https://en.wikipedia.org/wiki/Motorcross), [wrestling](https://en.wikipedia.org/wiki/Wrestling), [soccer](https://en.wikipedia.org/wiki/Soccer), [karate](https://en.wikipedia.org/wiki/Karate) or other [martial arts](https://en.wikipedia.org/wiki/Martial_arts) or any sport where a ball, foot, arm, knee or bat can come into contact with the groin.
* Diet: Healthy diets (i.e. the Mediterranean diet) rich in such nutrients as omega-3 fatty acids, some antioxidants and vitamins, and low in saturated fatty acids (SFAs) and trans-fatty acids (TFAs) are inversely associated with low semen quality parameters. In terms of food groups, fish, shellfish and seafood, poultry, cereals, vegetables and fruits, and low-fat dairy products have been positively related to sperm quality. However, diets rich in processed meat, soy foods, potatoes, full-fat dairy products, coffee, alcohol and sugar-sweetened beverages and sweets have been inversely associated with the quality of semen in some studies. The few studies relating male nutrient or food intake and fecundability also suggest that diets rich in red meat, processed meat, tea and caffeine are associated with a lower rate of fecundability. This association is only controversial in the case of alcohol. The potential biological mechanisms linking diet with sperm function and fertility are largely unknown and require further study.

Treatment

Treatments vary according to the underlying disease and the degree of the impairment of the male's fertility. Further, in an infertility situation, the fertility of the female needs to be considered.

Pre-testicular conditions can often be addressed by medical means or interventions.

Testicular-based male infertility tends to be resistant to medication. Usual approaches include using the sperm for [intrauterine insemination](https://en.wikipedia.org/wiki/Intrauterine_insemination) (IUI), [in vitro fertilization](https://en.wikipedia.org/wiki/In_vitro_fertilization) (IVF), or IVF with [intracytoplasmatic sperm injection](https://en.wikipedia.org/wiki/Intracytoplasmic_sperm_injection%22%20%5Co%20%22Intracytoplasmic%20sperm%20injection) (ICSI). With IVF-ICSI even with a few sperm pregnancies can be achieved.

Obstructive causes of post-testicular infertility can be overcome with either surgery or IVF-ICSI. Ejaculatory factors may be treatable by medication, or by IUI therapy or IVF.

[Vitamin E](https://en.wikipedia.org/wiki/Vitamin_E) helps counter oxidative stress, which is associated with sperm DNA damage and reduced sperm motility. A hormone-antioxidant combination may improve sperm count and motility. Giving oral antioxidants to men in couples undergoing in vitro fertilisation for male factor or unexplained subfertility may lead to an increase in the [live birth rate](https://en.wikipedia.org/wiki/Live_birth_rate) but overall the risk of adverse effects is unclear.

**2. Semen**

**Semen**, also known as **seminal fluid**, is an organic [fluid](https://en.wikipedia.org/wiki/Fluid) that contains [spermatozoa](https://en.wikipedia.org/wiki/Spermatozoon). It is secreted by the [gonads](https://en.wikipedia.org/wiki/Gonad) (sexual glands) and other sexual organs of [male](https://en.wikipedia.org/wiki/Male) or [hermaphroditic](https://en.wikipedia.org/wiki/Hermaphrodite) [animals](https://en.wikipedia.org/wiki/Animal) and can [fertilize](https://en.wikipedia.org/wiki/Fertilization) the [female](https://en.wikipedia.org/wiki/Female) [ovum](https://en.wikipedia.org/wiki/Ovum). In humans, seminal fluid contains several components besides spermatozoa: proteolytic and other enzymes as well as fructose are elements of seminal fluid which promote the survival of spermatozoa, and provide a medium through which they can move or "swim". Semen is produced and originates from the [seminal vesicle](https://en.wikipedia.org/wiki/Seminal_vesicle), which is located in the pelvis. The process that results in the discharge of semen is called [*ejaculation*](https://en.wikipedia.org/wiki/Ejaculation). Semen is also a form of genetic material. In animals, semen has been collected for cryoconservation. [Cryoconservation of animal genetic resources](https://en.wikipedia.org/wiki/Cryoconservation_of_animal_genetic_resources%22%20%5Co%20%22Cryoconservation%20of%20animal%20genetic%20resources) is a practice that calls for the collection of genetic material in efforts for conservation of a particular breed.

**Physiology**

**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_%28biology%29) 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_%28zoology%29). 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%22%20%5Co%20%22Monotreme) mammals, copulation is achieved through the physical mating of the [cloaca](https://en.wikipedia.org/wiki/Cloaca) of the male and female. 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).

**Human semen**

**Composition**

During the process of [ejaculation](https://en.wikipedia.org/wiki/Ejaculation), sperm passes through the [ejaculatory ducts](https://en.wikipedia.org/wiki/Ejaculatory_duct) and mixes with fluids from the [seminal vesicles](https://en.wikipedia.org/wiki/Seminal_vesicle), the [prostate](https://en.wikipedia.org/wiki/Prostate), and the [bulbourethral glands](https://en.wikipedia.org/wiki/Bulbourethral_gland) to form the semen. The seminal vesicles produce a yellowish viscous fluid rich in fructose and other substances that makes up about 70% of human semen. The prostatic secretion, influenced by dihydrotestosterone, is a whitish (sometimes clear), thin fluid containing proteolytic enzymes, citric acid, acid phosphatase and lipids. The bulbourethral glands secrete a clear secretion into the lumen of the [urethra](https://en.wikipedia.org/wiki/Urethra) to lubricate it.

[Sertoli cells](https://en.wikipedia.org/wiki/Sertoli_cell), which nurture and support developing [spermatocytes](https://en.wikipedia.org/wiki/Spermatocyte), secrete a fluid into seminiferous tubules that helps transport sperm to the genital ducts. The ductuli efferentes possess cuboidal cells with [microvilli](https://en.wikipedia.org/wiki/Microvillus) and [lysosomal](https://en.wikipedia.org/wiki/Lysosome%22%20%5Co%20%22Lysosome) granules that modify the ductal fluid by reabsorbing some fluid. Once the semen enters the ductus epididymis the principal cells, which contain [pinocytotic vessels](https://en.wikipedia.org/w/index.php?title=Pinocytotic_vessel&action=edit&redlink=1" \o "Pinocytotic vessel (page does not exist)) indicating fluid reabsorption, secrete glycerophosphocholine which most likely inhibits premature [capacitation](https://en.wikipedia.org/wiki/Capacitation). The accessory genital ducts, the [seminal vesicle](https://en.wikipedia.org/wiki/Seminal_vesicle), [prostate glands](https://en.wikipedia.org/wiki/Prostate_gland), and the [bulbourethral glands](https://en.wikipedia.org/wiki/Bulbourethral_gland), produce most of the seminal fluid.

Seminal plasma of humans contains a complex range of [organic](https://en.wikipedia.org/wiki/Organic_compound) and [inorganic](https://en.wikipedia.org/wiki/Inorganic) constituents.

The seminal plasma provides a nutritive and protective medium for the spermatozoa during their journey through the female reproductive tract. The normal environment of the [vagina](https://en.wikipedia.org/wiki/Vagina) is a hostile one (c.f. [sexual conflict](https://en.wikipedia.org/wiki/Sexual_conflict)) for [sperm](https://en.wikipedia.org/wiki/Sperm) cells, as it is very [acidic](https://en.wikipedia.org/wiki/Acidic) (from the native microflora producing [lactic acid](https://en.wikipedia.org/wiki/Lactic_acid)), viscous, and patrolled by immune cells. The components in the seminal plasma attempt to compensate for this hostile environment. Basic [amines](https://en.wikipedia.org/wiki/Amines) such as [putrescine](https://en.wikipedia.org/wiki/Putrescine%22%20%5Co%20%22Putrescine), [spermine](https://en.wikipedia.org/wiki/Spermine%22%20%5Co%20%22Spermine), [spermidine](https://en.wikipedia.org/wiki/Spermidine%22%20%5Co%20%22Spermidine) and [cadaverine](https://en.wikipedia.org/wiki/Cadaverine%22%20%5Co%20%22Cadaverine) are responsible for the smell and flavor of semen. These alkaline bases counteract and buffer the acidic environment of the vaginal canal, and protect [DNA](https://en.wikipedia.org/wiki/DNA) inside the [sperm](https://en.wikipedia.org/wiki/Sperm) from acidic denaturation.

**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%22%20%5Co%20%22Hematospermia)*, 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**

[*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)**

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

The presence of blood in semen or [hematospermia](https://en.wikipedia.org/wiki/Hematospermia%22%20%5Co%20%22Hematospermia) 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.