

CONCERNING POULTRY

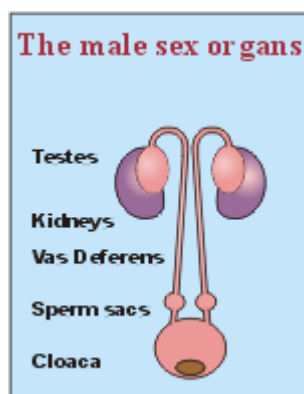
MATING and FERTILISATION

Photo: Jaqueline Mansveld.

By: Greg Davies (Australia)

As with all birds, a sexual liaison must occur between male and female for fertilisation to be achieved. Unlike pigeons, chickens are polygamous creatures, so one male will happily mate with lots of hens, the ideal ratio being about 5 females to 1 male. There is little tact or ceremony on the part of the male. He selects the female (usually the closest one to himself) droops one wing to the ground, circles her then grabs her by the back of the head and climbs on her back. Balancing himself by flapping his wings, he lowers his tail and places his vent in direct contact with that of the hen, where the passage of sperm from his cloaca to her oviduct takes place. The entire sex act takes less than 15 seconds and it appears the most satisfying thing for the female is fluffing the feathers and shaking the body immediately afterwards.

As said, chickens are polygynous, but certain males and females selectively mate regularly. Every now and then a female in the flock will show avoidance to a specific male, and therefore is rarely mated by that male.



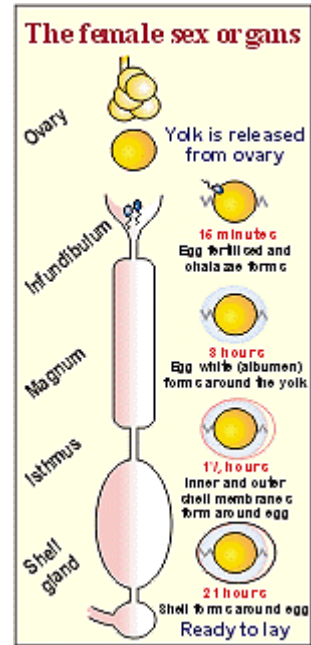
Once sperm has been transferred, they swim along the mucous lining of the oviduct until they reach the infundibulum where they fertilise the ovum as it passes through from the ovary. It takes some 7 to 10 days for the sperm to travel and that explains why it normally takes that long after initial mating for fertile eggs to occur. Conversely, a hen may still lay fertile eggs some 10 days after being mated for the last time.

Left: Male sex organs.

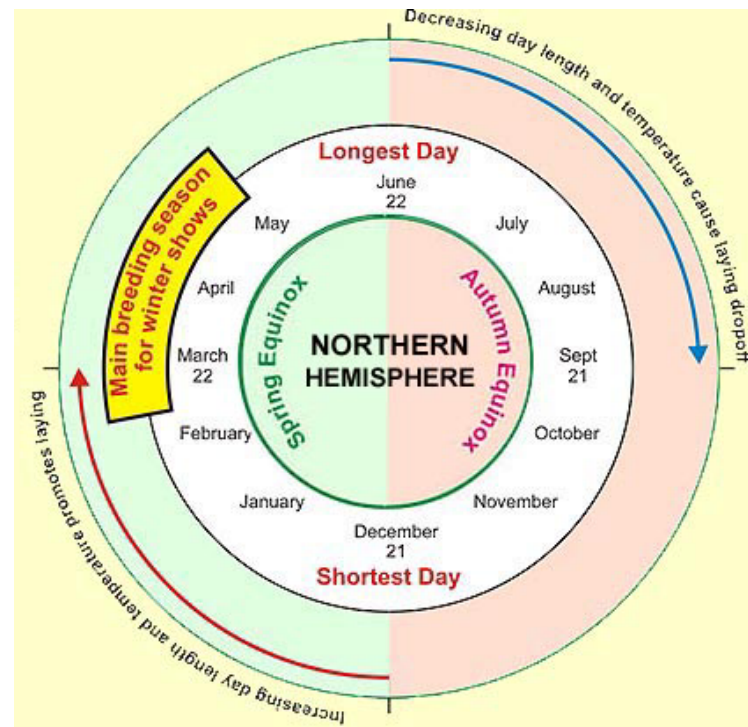
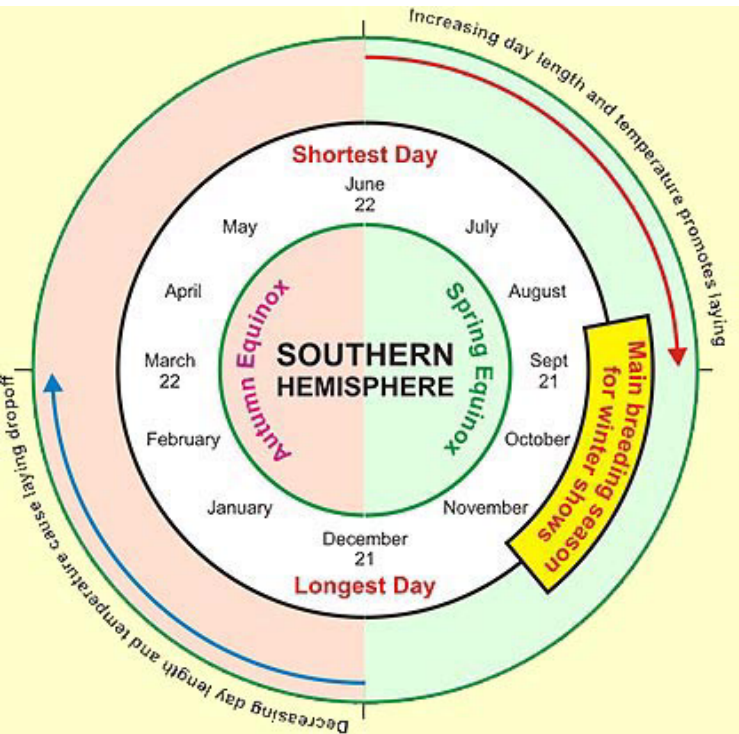
Right: Female sex organs.

Finally, none of this occurs until the correct lighting and weather conditions prevail. It is only when daylight hours reach a certain length and the temperature rises that birds will breed, (usually Spring).

These conditions act upon the birds' pituitary gland and promote sexual activity. It is this same reason why most hens stop laying completely through the winter months. This is all known as the *biological breeding clock*.



The breeding season according to the biological clock;
left: in the southern hemisphere, right: in the northern hemisphere.



An understanding of the natural mating behavior in chickens can help the breeder to observe the mating behavioral sequences in their pens to assess whether the fertility should be good, average, or poor. Since mating behavior generally follows a diurnal pattern, the best times to observe the flock are early in the morning or late in the afternoon.

The rooster usually ejaculates between 100 million and 5 billion sperm at a time with greater concentrations produced at the beginning than at the end of the day, when depletion occurs after many matings. First ejaculates average about 1 ml, but after several ejaculations the average volume will be reduced to 0.5 ml or less. These data were obtained from semen collection as done in artificial insemination. The numbers of sperm per ejaculate and the volumes of semen should be lower in natural matings as compared to semen collection by artificial stimulation and massage. The frequency of mating follows a diurnal pattern with mating frequency reaching peaks early and late in the day.

A rooster may mate from 10 to 30 or more times per day, depending on the availability of hens and competition from other roosters. However, the number of sperm per ejaculate is seldom less than 100 million which is the minimum required to maintain high fertility. With natural mating, better fertility will result when mating occurs after the hen has laid a hard shell egg. However, if the hens are mated frequently (daily), there is unlikely to be a noticeable difference in fertility regardless of when the matings occur.

From: Univ. of Georgia Cooperative Extension Service, Joseph M. Mauldin, Natural Mating and Fertilization.

Tips and tricks for a better fertilisation

By: Paul Cuypers, Dutch Sussex, Orpington & Dorking Club NSODC.

Source: Het Vlaams Neerhof, VIVFN magazine, Belgium.

Achieving optimum fertilization is a problem in many breeds. Every year there are many breeders who complain that the breeding results are disappointing and poor fertilization is usually one of the main causes. Especially in Orpingtons this is common, since some of the typical breed characteristics are not conducive to optimal fertilization. Orpingtons are very large and heavy, and the strength of their relatively small wings is absolutely insufficient for the rooster to keep his balance. When we observe mating Orpingtons we often see the rooster fall off the hen before the actual fertilization is completed. They are also very short and compact and cannot therefore bend their body enough to achieve the needed 'vent to vent' contact. Thus the roosters need many attempts to occasionally be successful. Even the most experienced breeders are very satisfied with 50% of fertilized eggs; they frequently have a bad year with much less success. It is never pleasant to have to throw away infertile eggs. Therefore it is very important to optimize all other factors.

First the rooster must be in breeding condition, otherwise it produces no sperm and mounting is useless. Do not be fooled by the fact that he does mount the hens; many breeders believe that this proves that he is okay, but also roosters that are not yet "in production" will most often mate with the hens.



Above: A breeding pen of Bresse fowl with a proud rooster. Photo: Dirk de Jong.

How to get your rooster in breeding condition

They should not be too skinny and definitely not too fat. In that case, have them lose weight without suffering, for instance by feeding many vegetables. They need varied and vitamin-rich food, including fruit and vegetables and herbs. Some wheat germ oil mixed in the feed is recommended. Exaggeration is never good.

When you plan to artificially extend daylight hours, start with the males one month earlier and increase the amount of light gradually by a half hour a week, so after one month the roosters are 2 hours 'ahead' of the hens. This is essential for a proper fertilisation during the full desired breeding period. If the males and females get the same daylight hours, the hens will be in breeding condition faster than the males. Either the roosters are too late in condition, resulting in poor

fertilization at the beginning of the breeding period, or you focus on the roosters and wait till they are 'ready', resulting in spoiling a lot of eggs (laid too early, when we do not want to breed yet). For many hens, one fact holds: that these eggs are really spoiled, because they won't keep on laying during the entire rearing period, or perhaps because they get broody.

**Left and below: Temptation tricks of the rooster.
Photo: Bobo Athes.**



Make sure the rooster is healthy and also free of parasites. Lice and red mites are truly disastrous for fertilization and it takes weeks after treatment before the birds are fit again. For that matter, this is one of the persistent misunderstandings in the fancy: one blames the infertility on the use of e.g. Ivomec or Frontline and similar pesticides, but it is the lice that one wanted to control that are the cause of problems that will linger on for quite a while. It is my experience that roosters do their job perfectly when they are preventively treated with Ivomec or Frontline. Just be critical and don't confuse the cause with the solution.

In the case of heavy breeds, see to it that the legs are OK. Orpingtons for example have extremely sensitive legs. Sole ulcers may look innocent, many breeders do not bother to cure them, but the animals do suffer. Frost damage to combs and wattles and toes is also disastrous for the breeding condition.

Realize that infertile roosters hardly exist. I've never had one since I know about roosters and mating. Don't believe myths about the age. Young cockerels already produce. Old males produce badly only at breeders who have yet to learn how to take care of their birds during the moult. Again and again we hear stories about 'old cocks first need to see the vernal sun and then later in the spring they will fertilize'. They take the attention away from the real cause: these cocks have not

quite finished their moult. Many birds start moulting late in the year. Often the breeders in the autumn just focus on their young chickens that they want to be ready for the show season, and they neglect their moulting breeding stock. Thus they moult irregularly and take much longer than by the book. So: give your moulting birds the best possible care, the best breeder pellets/mash, quite rich in protein, to make them feather optimally, smoothly and quickly.

Young roosters are inexperienced. They come from the exhibition season and have never been with the hens, because they were not to be damaged before the exhibitions. So they just need a few weeks to practice. To spare your best breeding hens you could give him some excess hens the first few weeks to practice before he joins the hens in the breeding pen.

Right: This cockerel needs more practice.

Photo: Nel Scharman.



A rooster can mate very often but the less time in-between, the less sperm you get. Logical. Research shows that a rooster in the morning with his two first matings consumes almost all of his sperm. Of

course new sperm is continuously created, but because he mates so frequently, the sperm transfer is very small. That is why breeders sometimes have better results when they house the rooster separately and put him only a few times per day with the hens. This way, the hens also get much less damaged.

Left: Typical wounds under the wing of a hen, caused by the sharp nails of the rooster. Photo: Monique de Vrijer.



Damage to the plumage of the hens, thus bare backs and ruined tails are almost unavoidable in soft feathered breeds. However, injury to the hens can perfectly be prevented, through taping the cock's nails. The tapes should be checked daily because they wear out quickly and they are lost and must therefore be replaced frequently.

The rear toes are important because they cause long wounds on the sides of the hen. Logical, because when the cock feels himself slide from the hen, he tries to claw back on her with his feet. In such a moment he may wound the skin of her back with his sharp rear toenail, or sometimes even tear the skin open. Wounds as long as 10 cm are no rarity. Some hens are tighter in their skin than others and then the wounds are only superficial. The inner toes

should also be taped because they cause short but deep cut higher on the back. Many breeders blunt the nails by filing. It does help but does not give certainty. Prevention is better than suturing; you avoid the recovery time of the sutured wounds to heal.

Chickens that are rich in down, like Orpingtons, fertilize better when the down around the vent in males and females is partially clipped away. The rooster mounts the hen and they have come cloaca to cloaca to transfer the sperm successfully. If there are a lot of feathers in the way, fertilization will not succeed. So, in the case of the male, we shorten the down under the vent and for the female we clip the down above the cloaca. I know that there are also stories told of flocks giving fine result without clipping but my experience is that in most Orpington breeding pens clipping the down does give better results.



Above: A beautiful, fluffy Cochin bantam pullet. Still clipping of down feathers is not always necessary.

Photo: Monique de Vrijer.

Check also for preferred hens. Many roosters have one or a few hens that they mate with more often than others. Also there are often females who don't like to mate and continuously succeed in giving the cock a wide berth. Sometimes older hens are very dominant and then the cockerel prefers to choose the other hens in the flock for his advances. All these problems can be avoided by dividing the breeding pen into small groups; not four hens together with one cock but preferably house the hens 2 to 2 and rotate the rooster. If you notice one hen more damaged than the other, occasionally put her apart for one day, so she can rest and the other hens will be mated more often. If you see that one hen maintains a perfect show condition and apparently is very seldom mounted, put her frequently in a not too large loft together with the male, and she will surely get her turn.

Some cocks are so active in the breeding pen that they eat too little and lose condition incredibly fast. You must keep an open eye for this as well. Put him apart occasionally, where he cannot see the hens, and he will eat much and greedy. This is a good way for him to keep his comfortable weight. Other roosters grow rapidly fat in the breeding pen. The hens are fed a lot for optimal egg production and the cock usually joins the feast. Sometimes a male is more interested in food than in the hens. This is usually a rooster that you already had to put on a diet before the breeding season. Check regularly by taking him in your hand and if he becomes too heavy, put him apart and feed the cock and the hens separately. Fatty roosters do not fertilize. Separate feeding has another advantage: this way you can make sure your cocks eat slightly less protein than is provided in the standard breeder mixtures for the hens, which is a bit better for the fertility of the roosters.

**Below: Chabo cockerel calls his hens to share a tasty morsel.
Photo: Piet Steeman.**



Every spring breeders call me again with bad news. That they have done everything but nothing works. Of course, even experienced breeders sometimes have a bad year. But fortunately, new season, new chance, and as you see there are quite a few things you can spend your energy in to turn your luck. I wish everyone success in the upcoming season.