

# CONCERNING POULTRY



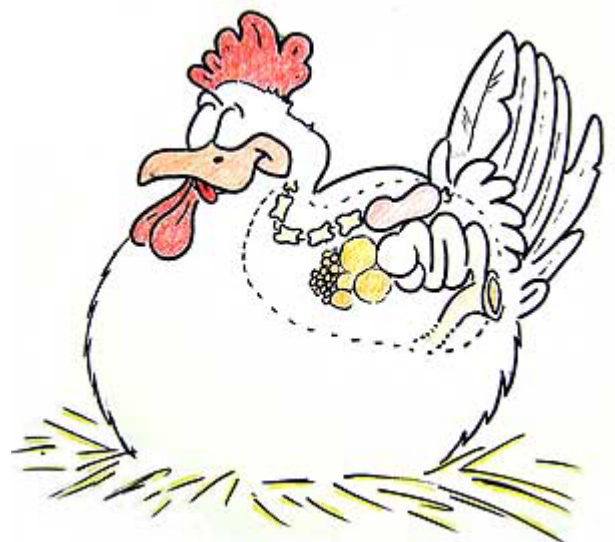
Shell-less egg. Photo: Rudolf Dantuma

## EGGS

Text, photos and cartoons: Monique de Vrijer

One of the greatest perks of raising chickens are the eggs! There is simply nothing more satisfying than freshly laid eggs from your own chickens. Our chickens are profuse layers so we are not surprised when egg abnormalities pop up (or out in this instance!) as this can be expected to occur from time to time without it necessarily indicating any serious condition in our birds. There are however viruses and bacterial conditions to be considered which can affect the eggs development.

First, let's take a look at the reproductive process of making and laying an egg. In the section of the hen's reproductive tract, called the ovary, are the ovum which will mature into yolks (a yolk is a mature ovum surrounded by a food source). The yolk is released into the oviduct (an "elastic" tube like organ approximately 75 cm long) which leads to the cloaca. Once released, it travels down to the section called the *infundulum* (this is the section where fertilization may take place) and then travels on to the section called the *magnum* where the "white" (*albumen*) is formed (this takes a couple of hours). Afterwards it travels down to the section called the *isthmus* where the outer layer of the white develops into a tough protective layer called the shell membranes. Shell formation is further developed in the next section of the tract, in the shell-gland or *uterus*, where the egg will spend approximately 21 hours and any colour pigmentation is deposited. In the last stage of formation, the *cuticle* or "bloom" is deposited (a waxy layer enveloping the entire egg) which serves a protective function against bacterial penetration and moisture loss. It is at this point, having travelled the complete length of the oviduct, the egg now enters the cloaca, which is the opening through which the contents of the urinary tract, intestinal tract and reproductive tract collectively





exit the hen. The egg is further protected from any faecal contact during expulsion as the membranal lining everts and protrudes out from the cloaca during lay.



**Photos above: The laying of an egg. During the lay, the egg is protected from contact with other internal systems: these photos shows the oviductal lining protecting the egg by protruding outside the cloaca during lay.**

### Shell-less Eggs

One of the most notable egg abnormalities is the egg without a shell. This shell-less egg (as the name implies) will totally lack the outer protective layer composed mainly of calcium carbonate and consist only of the "contents" held together by a thin outer membrane. This anomaly will often occur at the beginning of the egg laying cycle and is not unusual in and of itself when occurring after a non-laying period (the hen has to "restart" its internal system). It is often said to be caused by a calcium deficiency however, this is more often typified by a thin shelled egg than a true shell-less egg.



**Photos Shell-less egg: Rudolf Dantuma**

To help ensure a calcium deficiency does not occur, one should offer a constant "free-choice" (so not mixed in with the feed) supply of shell grit which usually consists of oyster shells. Free-ranging chickens will find this a useful addition to their natural sources.

If there is a dietary deficiency (feed related) yet only one particular hen is regularly producing the shell-less or thin-shelled eggs (while eating the same as the others), this will usually indicate something other than a calcium deficiency, or else the other hens would also show the same symptoms.

One of the viruses well known to cause these types of egg abnormalities is Egg Drop Syndrome (EDS) which is caused by an adenovirus. With this condition (unlike many others which affect egg production) the egg production is not particularly affected but the



affected birds are known to have a problem with shell-less and thin shelled eggs but this is often missed as the birds will often eat the abnormal eggs before the owner notices them thereby giving the (false) impression that there is a reduction in lay. The colour of the shell especially in brown egg layers is also affected because the section of the reproductive system where the EDS is active is the shell gland which in turn is damaged by the reproducing virus. Chickens of all ages can be affected by this virus and it is transmitted through the egg to the chicks. It affects some breeds more than others ... brown layer hybrids will suffer more than the white strain. The bird itself will usually suffer little from the virus and eventually recover and regain its laying capacity, but will still on occasion produce shell-less eggs from a previous infection. When your hen produces these eggs on a regular basis then this will usually indicate infection located within the reproductive tract, usually in the shell gland.



Left: Malformed eggs. Photo: Nel Staalman  
Above: 'Pimples' on the eggshell.  
Below: Malformed egg.  
Photos: Aviculture Europe

### Shell abnormalities

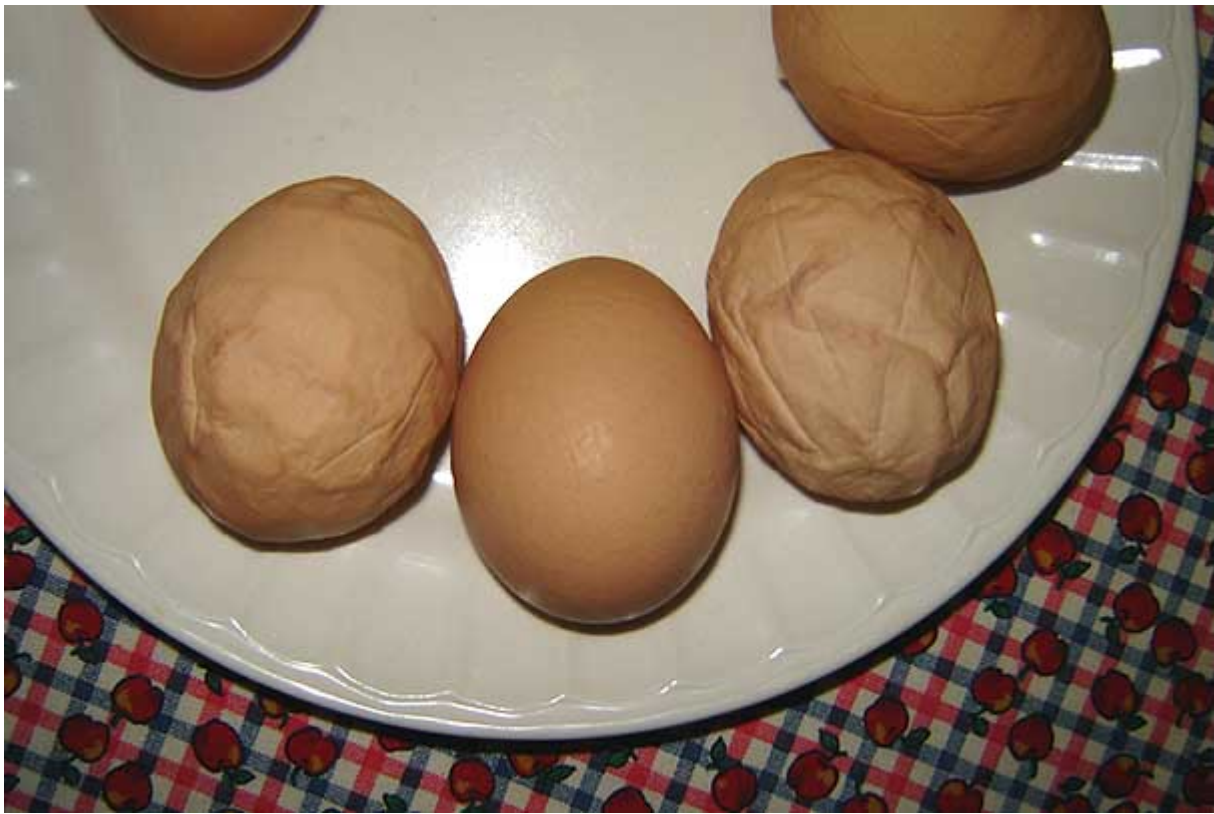
Other abnormalities having to do with external form or colour also commonly occur, including abnormalities in texture such as ridges (rough-shelled eggs or 'body checks'), pitting and pimpling (pimples=calcium deposits). These shell abnormalities can occur quite incidentally however, when such abnormalities occur on a regular basis (especially when combined with a reduction in lay) then one must consider that it is perhaps due to other causes; one of which is often Infectious Bronchitis (IB).



IB (current or having occurred in the past) not only causes abnormalities in the shell and colour of the egg but will often cause watery egg whites. IB has a preference for the mucous membranes not only of the respiratory system but also the reproductive tract affecting the entire egg forming process including the internal quality of the egg.

A reduction in lay is also often noted.





**Above: Examples of malformed eggs (probably caused by IB)  
Photo: Rudolf Dantuma**



**'PeeWee' Eggs and 'Rooster' Eggs**

What a surprise to find that your bird has laid a tiny egg instead of a normal sized one...you might think a dove had laid it instead of your chicken! The chance of a dove actually having laid in your chicken nest is rather small however, and it is more likely that your bird has produced what is called a 'pee-wee'. This will be a normal egg just miniature in size. It occurs occasionally (usually with young pullets just entering lay). However, if the eggs contents are not that of a 'normal' egg (consisting of a yolk and white) yet to all outward appearances looking like a 'normal' egg with a shell, then

you have what is often called a 'rooster egg'. This has usually been caused by a bit of sloughed off material, often from an inflamed or irritated oviduct, having found its way into the reproductive tract, which will in turn stimulate the oviduct to produce albumen /'white'

(see also below re: 'rubber' eggs) and form an egg shell encompassing it. This 'rooster egg' will usually consist only of egg white, though on occasion you may see what appears to be 'yolk' at the core, around which the white and shell have formed.



**Left: A rooster will on occasion 'sit' a nest however he will never lay an egg (not even a small one!) A dutiful rooster will often accompany the hen to her nest and remain with her.**



### **Double-Yolk Egg**

An egg with a double yolk will be an egg usually larger in size than the hen would normally lay as the two yolks will take up more room. This happens when an eggshell is formed in the oviduct around two yolks which have been released simultaneously. It has no use to try and incubate such eggs in the hopes that 'twins' will be hatched as this simply does not occur with chickens.

**Photo: Delphine Desmet**

### **Blood In or On an Egg**

Eggs with blood in or on the egg are also an occasional occurrence and are usually not indicative of anything seriously wrong (it can be caused by something as simple as stress). A few bloodspots on the egg will often indicate the presence of blood sucking types of mites/lice and when the amount of blood is more than just a few spots then this usually indicates an internal rupture of some type during the lay which one often sees with hens newly coming into lay (after a period of non-lay) or a young hen laying her first eggs which may be large in size.



Blood in an egg can occur when the egg has started to develop (starting to develop blood vessel system) which will stop when the egg is collected and thereby cools. Usually it will occur when the blood vessel has hemorrhaged during the release of the ova (future eggs) from the yolk follicles and the blood remains embedded in the yolk.

When the amount seems excessive then the hemorrhage that has occurred is usually indicative of certain infections known to produce such effects (these eggs are not fit for consumption).

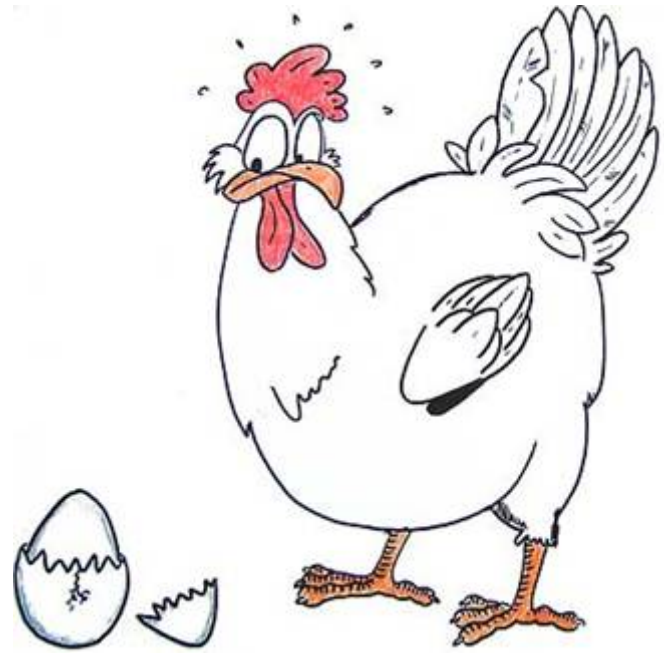
**Photo: Natasja Dikhoff**





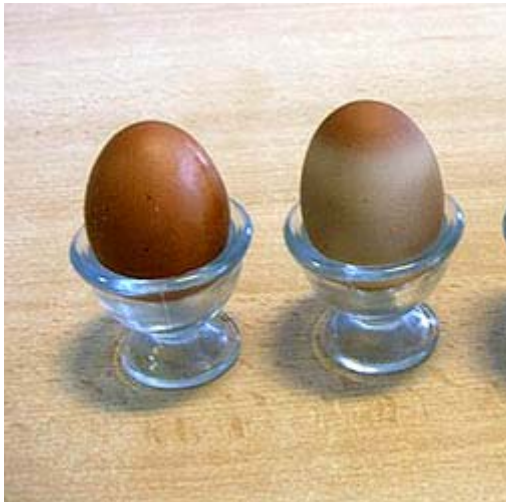
### **Egg-Within-an-Egg**

An egg-within-an-egg is an extremely rare occurrence, but does happen. We are not speaking of a double yolk but a fully formed and shelled egg encased within another eggshell! Once again we are speaking here of a fault in the reproductive process whereby the developing egg (for whatever reason) is reversed in direction by the wall of the oviduct and then when the following ovum/yolk is released from the follicles the problem of reversal is corrected and the shell is formed over them both (though often the "outer" egg will contain only the white).



### **Discoloration/Pale Eggs**

Each hen will lay her own unique egg and some owners know which hen has laid a particular egg. Egg colour is made by a gland and the older a hen gets the less pigment is produced by this gland (the "ink" so to speak dries up). The eggs generally become larger as the hen ages also which means that there is more surface area to be covered by the same amount of pigment which will result in a paler egg. This all adds up to a paler shade of egg from your hen as she gets older. There are however other causes of pale eggs such as IB (discussed earlier), avian influenza and Newcastle Disease. As these viruses have an affinity for the mucous membranes and multiply in the reproductive tract this often causes pale eggs. (Once again, a pale or miscoloured egg will not necessarily indicate disease but is a definite symptom when other indications of illness occur).



**Discoloured egg. Photo: Cetinel Fatma**

Stress can also cause discoloration in the egg. This happens as the bird produces stress hormones which are known to disrupt the pigmentation process. The pigment is laid down in the last phase of shell formation and if the bird is substantially disturbed during this part of the process then the disruption can cause a paler egg colour.

Medications such as those used to treat coccidiosis and the antimicrobial sulphonamides are also known to influence pigmentation and can cause pale eggs.

### **False Layer**

A "false layer" is a specific reproductive disorder in which a hen, to all intents and purposes, goes through all the motions of laying an egg (including squatting in the nest, and having a red comb and wattles) yet produces no egg. She will even cluck afterwards as if she has laid one, however there is none to be found in the nest! Often this is the result of suffering Infectious Bronchitis (IB) in the first few weeks of life and the virus has damaged the reproductive tract. The ovary and hormonal system is still functional in this condition (which accounts for the egg laying behaviour) however, the damage to the reproductive tract will cause the yolk to miss being caught up in the infundibulum (and the reproductive process that occurs in the oviduct) and it will drop into the abdominal cavity

instead. There is a grave risk of infection (peritonitis/salpingitis>see below) and ascites (water belly) with this condition. When ascites is present the area around the cloaca will fill with fluid often resembling a 'ball' (up to a litre of fluid can accumulate!) and she will often assume a penguin-like stance, give a very ill outward appearance and ultimately succumb.

### **(Egg)Peritonitis and Salpingitis**

Both of these infections are directly associated with a high incidence of death in the laying hen and often associated with Escherichia coli bacterium in particular being associated with peritonitis. (Egg)Peritonitis is the result of yolks being deposited in the abdominal cavity as a result of reproductive disease and is often paired with salpingitis which is an inflammation of the oviduct (inflammation of the oviduct can occur with many conditions including IB).

Often the affected hen will go for some time without showing many outward signs of illness however, once truly symptomatic (listless, hunched over, little appetite) it will usually progress to an acute phase fairly quickly. Salpingitis can also cause "rooster" eggs (see above) as the inflamed oviduct may slough off a bit of material which the oviduct will 'see' as a yolk and treat it accordingly and encapsulate it in a shell, however, when there is no shell formed around it, it is often referred to as a 'rubber' egg.



**Left: This egg is laid by a layer hybrid. A 'rubber' egg where the core of infection material is the result of salpingitis. This hen succumbed a few months later after she produced a few more. Photo: Nel Staalman.**

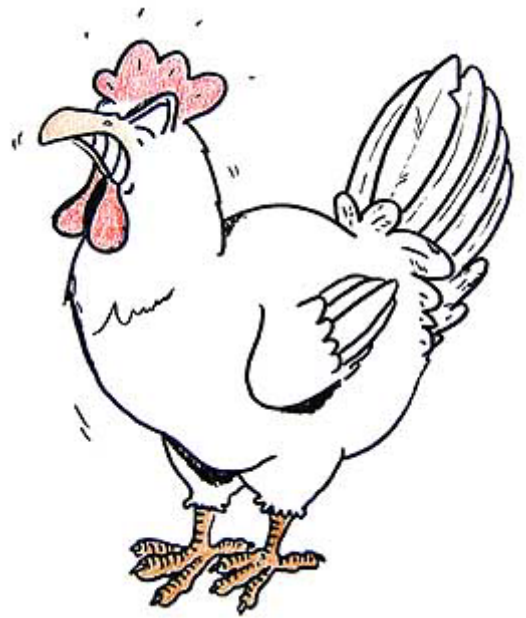
The hen can expel this substance and will behave as though she has laid an egg, however when the internal contents are examined then an infection source is often clearly seen (where the 'yolk' should have been) and it will often give a solid rotten appearance at the core. (The only time I have seen such in a photo, it looked a bit like a dried up potato.) Usually though this material (sometimes consisting of a core with perhaps shell calcium or infection fluid which has solidified encapsulated within albumin) will remain in the reproductive tract (in this case it will sometimes cause the paralysis of the system) or find its way into the abdominal cavity.

It is often noted that a hen will suffer from both conditions as salpingitis will often cause the yolk material to be deposited in the abdominal cavity and this will cause peritonitis. Medication in an early stadium can be helpful but often the problem returns and the bird eventually succumbs to the underlying cause of the infection.



## Egg-bound

When an egg can not be laid then we say the hen is *egg-bound*. This often happens with a hen's first egg or with an egg which is larger in size than she normally would lay. It can also occur if the shell is very rough; then passage through the tract will slow, mucous surrounding the egg will dry and slow the passage even more. When a hen is egg-bound she will often have trouble walking and stand hunched up, straining continuously, often with a vent fouled from faeces. A quick response is needed with an egg-bound hen: first, the hens vent should be smeared in with a lubricating substance such as K-Y jelly, Vaseline or even oil (use your finger to do this) and check gently to see if you can feel an egg. Next you will need to sit the hen in a bath of warm water in order to help relax the muscles (your bird will usually not protest once placed in the bath and will most likely will 'enjoy' it as it usually provides some relief!) When your bird has calmed down in the bath then you can try to gently massage the egg towards the cloaca to exit. When this does not work then it is time to call in the vet. (When an egg is too large then the above measures are often not enough and an experienced vet can continue with more extensive measures to expel the egg). Sometimes it is necessary to release the egg of its contents but this should never be attempted by any other than a veterinarian as there is considerable risk involved with doing so as a broken shell can damage the oviduct and also lead to infection.



## Cloacal Prolapse

A cloacal prolapse is when the portion of the oviduct (vagina) and the 'inside' lining of the cloaca (which is everted out to deliver the egg) is unable to retract; in the case of an egg-bound hen the prolapse can be exacerbated by the constant straining to expel the egg. Constant straining in the case of egg retention remains a complicating factor in treatment.

It is crucial when confronted with a prolapse to immediately separate the hen from the others as the blood will encourage them to peck at it which can cause further internal damage if the prolapse is pulled out further and pecked upon.



First, clean the prolapse gently with cold water (not too cold of course) to help with swelling and then apply a lubricating material to it such as K-Y jelly (or even Vaseline or oil) and gently reinsert the prolapse back into the cavity.

**Left: Prolaps  
Photo Mandy R.  
(U.S.A.)**



When you succeed in doing this then it is very important that the bird remains separated in a warm and darkened place to rest and hope for the best!  
(Be alert for flies which will be attracted to the inflamed cloaca to lay their eggs which means maggots).

Even when you are successful in replacing the prolapse, the question remains if the hen will not prolapse again with the next egg laid. Prognosis varies but in general one must not be surprised if the condition repeats itself. (In this case it is better to relieve said hen from her suffering). Sometimes a veterinarian will choose to stitch a portion closed (temporary aid) but at a certain point the suture will come loose with egg laying. On the other hand it may be a situation where the hen recovers quickly and has no further problems!

### **In Conclusion**

In this article I have touched on the most commonly occurring egg and reproductive problems but emphasize that if the problem is not a *recurring* one then there is usually little to be concerned about!

