

Why Have My Hens Stopped Laying?

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Egg production in a chicken flock follows a typical curve. While the curve is similar for most breeds of chickens (Figure 1), the specific numbers can vary significantly, especially with regards to age at first egg, peak production rate, and egg weight. Egg production typically begins when the pullets reach 18-22 weeks of age, depending on the breed and season. Egg production, as a percent of hens housed, rises sharply until it reaches its peak about six to eight weeks later. Peak production levels of 90 percent or greater are common with some of the egg-laying breeds (such as leghorns). Production then gradually declines, eventually reaching a level at which the hens are consuming more money in feed than they are producing in eggs. The flock can then either be terminated or put through a molt to start a second laying cycle.

Hens will lay fewer eggs each year. While some hens lay for 10 years, most are economically productive for only two years. So one of the first factors to consider when your hens stop laying is the age of the flock.

It is also important to verify egg production—not the number of eggs collected—has dropped. If the hens are eating their eggs—a common problem—the number of eggs collected will be reduced even though egg production has not dropped. Similarly, make sure the hens are not hiding their eggs and that the eggs are not being eaten by a predator.

Several factors can adversely affect the egg production of a flock, often resulting in a sudden drop in egg production. Determining the cause of a production drop requires a review of the history of the flock, including lighting program, feed consumption (quality and quantity), water intake, parasite infestation, disease, and any changes in management practices. Table 1 summarizes some of the non-disease causes of a drop in egg production.

Figure 1. Typical Egg Production Curve for Chickens.

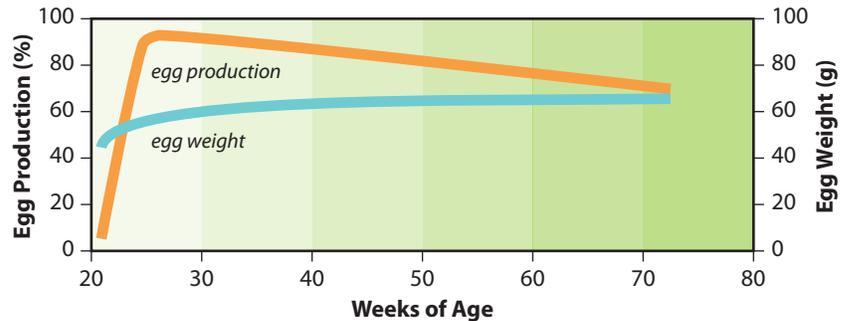


Table 1. Non-infectious Causes of Reduced Egg Production.

Causes of Decline	Signs/Symptoms
Management Mistakes	
Out of feed	Increase in flock nervousness, decreased feed consumption
Out of water	Blue combs, chickens gathered around waterers
Inadequate day length	Unusual pattern of egg production
High ambient temperature	Reduced egg size, reduced feed consumption, increased water consumption, panting
Improper Nutrition	
Salt—too little	Increase in flock nervousness, increased feather eating
Salt—too much	Increased mortality due to kidney disease, reduced feed intake
Calcium—too little	Increased incidence of shell-less eggs
Phosphorus—too much	Reduced feed intake, increase in thin-shelled and/or shell-less eggs, soft bones
Vitamin D ₃ —too little	Increased mortality from calcium depletion, increased incidence of shell-less eggs
Vitamin D ₃ —too much	Increased shell-less eggs, soft bones
Protein	Increase in flock nervousness, increased mortality (peck outs/cannibalism), poor egg albumen quality, feather eating
Fat	Low body-weight gains, drop in egg size
Nutrition: Anticoccidials	
Nicarbazin	Increase in the incidence of shell-less eggs, loss of pigment of brown eggs, reduced fertility and hatchability in breeder flocks
Monensin	Reduced feed consumption, lack of coordination
Nutrition: Moldy Feed	
Mycotoxins	Increase in flock nervousness, mouth lesions, reduced feed intake, increase in the incidence of thin-shelled eggs

Management Mistakes

Out of Feed

If hens are out of feed for several hours, a drop in egg production typically will occur. The level of decline is related to the amount of time the hens have been out of feed.

Out of Water

Water is often taken for granted, and yet it is the most essential nutrient. Hens are more sensitive to a lack of water than to a lack of feed. Water represents about 70 percent of an animal's body weight. It is important the chickens have access to fresh water year round. Frozen water is often a challenge in the winter.

Insufficient Day Length

Sexual activity in chickens, including egg laying, is affected by the number of hours of light in a day. Chickens can be made to lay year round by the use of supplemental light. Day length refers to the number of hours of light in a day.

Egg production in chickens is stimulated by increasing day lengths, and they typically will go out of production with decreasing day lengths. If no artificial light is given, egg production of a chicken flock will typically decline in the autumn.

Once stimulated to come into production, hens require 14 hours of light per day to maintain their production. Once the number of hours of light per day drops below 12 hours, production will decrease and often stops.

To prevent the typical autumn drop in egg production, provide artificial light to maintain a constant day length of at least 14 hours per day. A single 40 watt light for each 100 square feet of coop is sufficient. The supplemental lights should be provided in the morning hours so that the hens can roost as the sun goes down. This will prevent hens from being stranded in the dark after the lights go off. Most hens lay their eggs in the morning, so adding light in the morning typically results in most of the eggs being laid early. This is especially important if the hens are free to range during the day—if laid early in the day the eggs will typically be laid in the nest boxes, keeping the eggs cleaner and easier to find than if they are laid while the hens are outside.

High Ambient Temperature

High temperatures can cause problems in poultry. This is typically referred to as 'heat stress.' Feed consumption, egg production, egg size, and hatchability are all adversely affected under conditions of severe heat stress. Shade, ventilation, and plenty of cool water help reduce the adverse effects of heat stress.

Improper Nutrition

One of the most common causes of drops in egg production is improper nutrition. Hens require a balanced diet in order to sustain a high level of production. Feed rations are formulated to meet all the daily nutritional requirements of laying hens in the typical amount of feed consumed. Many producers try to reduce their feed costs by supplementing their layer ration with **scratch grains** or **table scraps**. Doing so may result in an imbalance in the hen's diet.

Many times the imbalances in the diet of the laying hens result in a drop in egg production or an increase in the incidence of problems such as prolapse (also known as egg blow-outs). **Prolapse** is a condition where the reproductive tract of a hen is pushed outside the body of the hen. Prolapse can be caused by a hen being too fat and/or the egg being too large. Permanent damage to the hen is common with prolapse. In some cases the condition may be fatal. An increase in the incidence of prolapse also can increase the incidence of cannibalism in a flock.

Once in a while feed manufacturers make a mistake and produce a feed missing in one or more key ingredients. Similarly, an oversupply of some of the key ingredients will also have an adverse effect on egg production. If egg production drops after starting on a new purchase of feed, then feed composition should be considered as a possible cause.

Most animal feeds will contain added **salt**, usually in the form of **sodium chloride**. Iodine is rarely added as a separate ingredient in poultry diets. Instead, iodized salt is routinely used. This type of salt is usually blue.

Animals have an innate desire to consume salt. Feeding hens a salt-deficient diet will lead to an increase in the incidence feather pecking in the flock in addition to the decline in egg production.

Although the salt requirement of chickens is relatively low, adequate levels are essential, and care must be taken to not provide excess salt in the diet. Excess consumption of salt causes wet droppings. Several feed ingredients, such as fish meal, corn gluten meal, meat meal, whey and sunflower meal contain high levels of sodium. When such ingredients are used, the level of supplemental salt (NaCl) in the diet must be reduced.

The two components of salt, sodium and chloride, have roles in poultry nutrition.

Sodium is an essential nutrient, playing a major role in maintaining body fluid volume, blood pH, and proper osmotic relationships. A continuously low intake of salt can cause a loss of appetite. Sodium deficiencies adversely affect utilization of dietary protein and energy, and interfere with reproductive performance.

Chlorine is also an essential nutrient. Hydrogen chloride (HCl) released from the stomach of chickens (proventriculus) is important in digestion. Chlorine also plays a role in maintaining osmotic balance in body fluids. Chickens deficient in chlorine are more nervous, showing increased sensitivity to sudden noise.

Calcium

The egg shell is composed primarily of **calcium carbonate**. The growing pullet has a relatively low requirement for calcium, but when the first egg is produced there is a four-fold increase in the calcium requirement. The majority of this calcium is used for the production of egg shells. Inadequate calcium consumption will result in decreased egg production and lower egg shell quality.

Hens store calcium in medullary bone, a specialized bone capable of being used as a calcium source for egg shell production. As calcium stores in the medullary bone are depleted, the bones become brittle. The condition is known as **caged-layer fatigue**. Chickens on the ground or on litter floors recycle calcium and phosphorus through consumption of feces, and do not typically get caged-layer fatigue.

Young birds should *not* be fed a high calcium layer diet because the calcium/phosphorus ratio will be unbalanced for their needs, resulting in increased morbidity or mortality.

Phosphorus

The nutritional requirement of phosphorus is closely linked to that of calcium. Bones contain both calcium and phosphorus. The ratio of dietary calcium to phosphorus affects the absorption of both so that an excess of one will reduce the absorption of the other. The result can be a loss of egg production and an increase in thin-shelled or shell-less eggs. Soft bones can also occur.

Vitamin D

Vitamin D₃ is required for normal calcium absorption and utilization. If inadequate levels of vitamin D₃ are fed the calcium in the diet is not absorbed well. This can result in a calcium deficiency and a drop in egg production even though the diet has sufficient calcium.

Excess vitamin D₃ can lead to increased calcium absorption resulting in too high a level of calcium which will reduce egg production. For short periods of time poultry can tolerate up to 100 times their requirement so an excess of vitamin D₃ is unlikely.

Protein

An animal's dietary requirement for protein is actually a requirement for the amino acids that make up the protein. There are 22 amino acids in body proteins, and all are physiologically essential. Poultry cannot synthesize some of these, or cannot synthesize them rapidly enough to meet the metabolic requirement. As a result, these amino acids must be supplied in the diet. Amino acid requirements vary considerably according to the age, type, breed and strain of the chicken. It will also change when there is a change in the productive state of the chicken (i.e., growing, laying eggs, etc.). Methionine is the amino acid most often deficient in laying rations.

When pullets begin laying, there is an increase in protein, vitamin and mineral requirements per day due to deposition in the egg. If dietary protein is too low or if the requirement for any of the amino acids is not met, poor egg production and hatchability will result.

Fat

While dietary fat is an important source of energy, it also contains linoleic acid, an essential fatty acid. A deficiency of linoleic acid will result in a decrease in egg production. Dietary fats also serve as "carriers" of fat-soluble vitamins, and some fat is necessary for absorption of these vitamins. Many vitamin A, D, E and K deficiencies result from too low a level of fat in the diet.

Nutrition: Moldy Feed

Improperly stored feed may become moldy. Molds can produce mycotoxins which, when consumed, adversely affect the health of the chickens and can reduce egg production. More than 300 mycotoxins have been identified. The result of feeding diets contaminated with mycotoxins will depend on the mycotoxin involved. Mycotoxins can interfere with the absorption or metabolism of certain nutrients, and calcium and/or vitamin D deficiencies can result when fed to laying hens. In addition, some mycotoxins may have hormonal effects which can be another cause of a drop in egg production.

Corn is the cereal most commonly used in poultry diets. The major mycotoxin of concern with corn is aflatoxin, produced by the mold *Aspergillus flavus*. Corn can become moldy in either the field or in storage. Aflatoxin fluoresces under ultraviolet light, so its presence can be detected by examining grain under a black light. If feed becomes wet, it should be discarded.

Nutrition: Anticoccidials

It is important that only laying hen rations be used. Diets for replacement pullets and meat chickens raised on litter floors may include coccidiostats (to control the parasitic condition known as coccidiosis).

Nicarbazine is an anticoccidial drug that reduces reproductive performance. The yolk membrane is weakened resulting in a condition known as mottling. In addition, when nicarbazine is fed to brown egg layers, the egg shell color changes to white within 48 hours. This change, however, is completely reversible if the product is removed.

Monensin is an ionophore commonly used to control coccidiosis in chickens. Ionophores, including monensin, have been reported to adversely affect egg production when hens are fed low protein diets.

Health

External Parasites

The **northern fowl mite** (*Ornithonyssus sylviarum*) is the most common external parasite of poultry. Northern fowl mites are blood suckers and are irritating to poultry. Anemia occurs in heavy infestations of chickens, reducing feed efficiency, egg production, and the ability to withstand and overcome diseases.

Several species of **chewing lice** may be found on chickens, especially those on range. Chicken lice feed on dry scales, feathers, or scabs on the skin. As lice

Table 2. Parasites that Lead to Reduced Egg Production.

Causes of Decline	Signs/Symptoms
External Parasites	
Northern fowl mite	Increase in flock nervousness, mites found on the chicken (usually around the cloaca)
Lice	Increase in flock nervousness, weight loss, reduced feed intake
Stick-tight fleas	Fleas embedded in the fleshy parts of the chicken's head around the eyes
Internal Parasites	
Nematodes (round-worms)	General unthriftiness, reduced feed efficiency, increased mortality (in severe infestations)
Cestodes (tape-worms)	General unthriftiness, dry and unkempt feathers, chickens eat but lose weight

crawl over a chicken, their mouth parts and sharp claws scratch the skin. The constant irritation causes the chicken to become nervous and behave abnormally, causing a general unthriftiness and unkempt appearance in the bird. Egg production in infested flocks may drop as much as 10 percent, although some heavy infestations have caused egg production to fall as much as 20 percent.

Stick-tight fleas are sometimes a severe problem in home flocks and may be difficult to prevent or eradicate. The adult female flea attaches to the skin around the face and head, causing severe irritation and, in some cases, blindness.

Internal Parasites

Heavy infestations of internal parasites can cause unthriftiness, poor feed efficiency, poor growth, reduced egg production, and mortality in flocks with severe infestations. Infected chickens may also be more susceptible to various diseases and stresses.

Nematodes, or roundworms, are elongated, cylindrical, unsegmented parasites of the chicken digestive tract. There are many species of roundworms, each tending to infect a specific area of the digestive tract.

Tapeworms (cestodes) are white or yellowish ribbon-like segmented flat worms. They vary in size from 0.17 to 12 inches in length. Although tapeworms do not produce extensive lesions or damage to the intestines, they compete with the chicken for the nutrients they consumed. Tapeworms do not digest their own food. Instead, a tapeworm anchors itself to the inner wall of the chicken's intestines, absorbing nutrients before they can be absorbed by the host. A variety of commercially available anthelmintics will effectively and safely eliminate both nematodes and cestodes from poultry.

Disease

Disease problems can occur in the best managed flocks. One of the first signs of disease in an egg laying flock is a decrease in egg production. Other symptoms include dull and listless appearance, watery eyes and nostrils, cough, molting, lameness, and an increased mortality. See Table 3 for a summary of some of

Table 3. Common Diseases and Conditions that Can Cause a Drop in Egg Production.

Disease	Signs/Symptoms
Fowl pox	Scab-like lesions on the unfeathered body parts (especially face and comb)
Coccidiosis	Bloody droppings Higher than normal mortality Diagnosis is based on characteristic gross lesions in the intestines
Infectious bronchitis	Respiratory signs: coughing, sneezing, and rales Egg production drops markedly (by as much as 50 percent) Soft-shelled or misshapen egg Watery egg white Hens typically laying brown-shelled eggs start laying white-shelled eggs
Newcastle disease	Reduction in feed and water consumption Respiratory distress Dramatic drop in egg production and decreased shell quality Twisted neck Increased mortality
Avian influenza	Listlessness Facial swelling Respiratory signs: sneezing and coughing Dark red/white spots on legs and combs Diarrhea
Avian encephalomyelitis	Seldom show clinical signs, just a slight, temporary drop in egg production
Mycoplasma gallisepticum	Respiratory signs: coughing, sneezing, snicks, rales, nasal and ocular discharge Decrease in feed consumption Decrease in egg production
Fowl cholera	Sudden/unexpected deaths Reduction in feed consumption Swollen wattles Nasal and ocular discharge Cyanosis of the head White water or green mucoid diarrhea
Infectious coryza	Swelling and puffiness around the face and wattles Thick, foul-smelling nasal discharge Labored breathing Decrease in feed and water consumption

the diseases affecting egg production and the signs to look for. A diagnosis should be made by an avian pathologist at an animal diagnostic laboratory. Two important resources in Kentucky are the University of Kentucky's Veterinary Diagnostic Lab in Lexington and the Murray State University Breathitt Veterinary Center in Hopkinsville.

The University of Kentucky's Veterinary Diagnostic lab

(formerly the Livestock Disease Diagnostic Center)

P.O. Box 14125
1490 Bull Lea Road
Lexington, KY 40512-4125
Phone: (859) 253-0571
Fax: (859) 255-1624
Website: www.lddc.uky.edu

Murray State University Breathitt Veterinary Center

P.O. Box 2000
715 North Drive
Hopkinsville, KY 42241-2000
Phone: (270) 886-3959
Fax: (270) 886-4295
Website: <https://breathitt.murraystate.edu/>

The best way to protect your flock against disease is to buy healthy chickens. If you want to increase your flock size, buy chicks from a reputable hatchery (certified by the National Poultry Improvement Plan as Salmonella-free) or hatch some of your own eggs. Adult chickens can look healthy and still carry diseases.

Stress

Any stressor such as moving and handling the chickens, changes in environmental conditions, or fright may contribute to or be the main cause of a drop in egg production.

Common stressors include:

- **Chilling:** Chickens do not handle damp conditions well, especially if there is also a draft.
- **Handling or moving:** Once the laying flock is placed it is best to limit any moving or handling of the chickens. Switching roosters in a flock or switching hens from one flock to another will disrupt the pecking order of the flock. The result is a temporary 'social stress.'
- **Fright:** Some breeds of chickens are more prone to the effects of fright than others. Regardless, it is good to limit the movement of small children, dogs, livestock and vehicles around your flock. Loud noises may also frighten chickens.

Summary

Numerous factors may adversely affect egg production in chicken flocks. Try to identify the cause of the drop in egg production by answering following questions:

1. How old are the hens?
2. Are the birds getting enough clean water?
3. How much feed are the hens consuming daily?
4. Has the level of feed consumption changed lately?
5. Has there been a change in the type or source of feed used?
6. Is the feed moldy?
7. How much light do the birds receive daily? Has it changed?
8. What is the light source?
9. What is the condition of the poultry houses?
10. What is the condition of the birds?
11. How active are the birds?
12. What is shell quality like?
13. What is interior egg quality like?
14. Are there any signs of disease?
15. Are the hens crowded?
16. Are there any signs of internal or external parasites?
17. Do the hens have access to plants they did not have access to before?
18. Have any pesticides or herbicides been used in the area?