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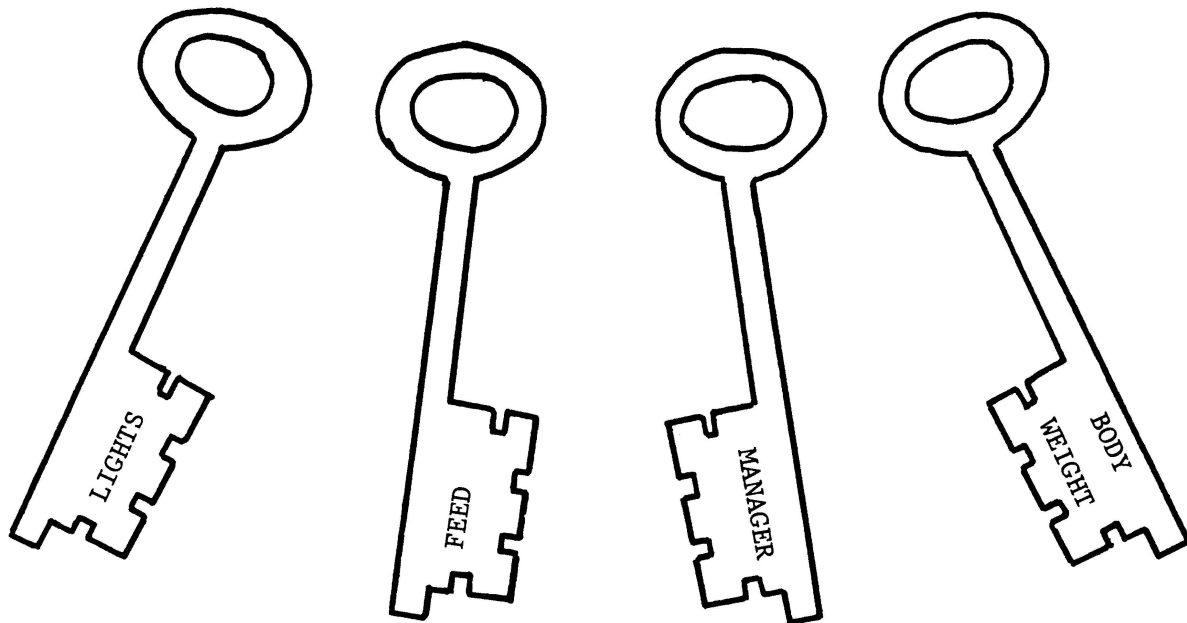
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THE KEYS

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TO SUCCESSFUL FORCE MOLTING

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THE KEYS

To Successful Force Molting of Leghorn-Type Hens

To molt or not to molt - that is a question which many egg producers will have to consider sometime. Before any decision can be made with any degree of accuracy, we need to understand what natural molting is and how to adapt it to effective flock management. Natural molting normally occurs once a year in laying hens. During molting, egg production stops while the hen's body takes a rest and rebuilds organs and tissues which have been depleted by the load of heavy egg production. Molting can also occur as a result of a stress such as disease, lack of feed or water, improper lighting, or other faulty management practice. A few hens may molt and lay at the same time. However, these hens usually take longer to molt and lay at a lower rate while they molt.

A poultryman can use this natural phenomenon to force-molt a flock of layers and gain an economic advantage. Force molting a laying flock results in some degree of feather loss together with a ceasing of egg production and a rapid drop in body weight. After a period of rest, the flock is allowed to regain weight, replace lost feathers and return to production. When molted properly, hens can return to a high level of production and produce mostly large eggs with improved interior quality and stronger shells. The degree of improvement is usually correlated with the performance of the flock in its first production cycle, as well as the management skill of the producer.

There are many methods of force-molting laying hens. Most of them work, but with varying degrees of success. Some work very well. The skill of the producer in managing the flock is the primary key to the

success of any molt. There are two force molting guides outlined at the back of this bulletin which have been developed over several years. If used correctly, they will guide any Virginia egg producer through a successful molt program.

You should understand and use the force molting keys discussed in this bulletin, if you are to molt a flock and attain the highest performance level possible. These keys will apply not only to the enclosed molt guides but also to any other sound molting program.

DECISION KEYS

1. Molt only flocks that were good producers during the first cycle. Molting usually will not improve the performance of a poor producing flock during the second cycle. However, when the first-cycle performance was poor because of management and not physiological deficiencies, molting may improve the second cycle provided that no major physiological damage has occurred.
2. Usually, it is not a good practice to molt birds that have laid over 12-14 months during the first cycle. Birds that have laid for longer periods do not tend to respond well to forced molting. Normally, it is not economically sound to molt birds before 8 months of lay.
3. Molt only healthy, vigorous birds. Cull all others.
4. Flocks to be molted should be checked by a diagnostic laboratory for subclinical diseases and parasites. This may affect the decision to molt and/or the length of the molting period.
5. If possible, schedule the molt during periods of low egg prices.
6. Production during the second lay cycle should be about 88 to 90% of the first-cycle production.

7. Birds that are molted for a period of 6 to 8 weeks perform better and for a longer period of time during the second cycle than birds molted over a shorter period.

ECONOMIC KEYS

The salvage value of the hen plus the cost of feed required during the molting period relative to the cost of a 20-week-old pullet is a common rule of thumb used to determine if molting will be economical. It is also necessary to weigh the current egg market and feed costs against future projections. A pullet may lay about 5-dozen fewer large eggs than a molted hen the first 8 months of production. Depending upon the type of molting program and ration used, from 6 to 8 pounds of feed are required to molt a hen until 50 percent production is attained.

<u>Factors Affecting the Choice of Flock</u>	<u>Type of Flock Favored</u>	
	<u>Pullet</u>	<u>Molted</u>
Higher pullet costs		+
Higher spent hen prices	+	
Higher egg prices	+	
Higher feed prices	+	
Higher capital financing costs		+
Demand for large and extra-large eggs		+
Strong breaker market		+
Reduced 2nd lay rate of lay	+	
Reduced 2nd lay feed efficiency	+	

Advantages of Force Molting

1. Hens in one flock are all molted together.
2. Initial replacement costs are spread over a longer production period.
3. Shell strength and interior quality are restored to a level approximately equal to that of a flock in production for 4 months.

4. A flock is taken out of production at the discretion of the producer, such as when eggs are selling below or at the cost of production.
5. The percentage of large eggs is increased.
6. Cost of feed to bring a flock into production is reduced.

Disadvantages of Force Molting

1. Risk of perpetuating diseases on farms with multiple-age flocks.
2. Income from laying facilities stops during the molt while certain costs continue.
3. The amount of feed to produce a dozen eggs is increased 10 to 15 percent.
4. Slightly higher mortality may occur during the second cycle of production.
5. Handling of every bird is desirable but not necessary to remove all culls before molting.
6. Eggs from molted hens may not always be acceptable for the existing market due to possible deterioration of the shell and interior quality after 5 to 6 months of production, particularly during hot weather.

MANAGEMENT KEYS

LIGHTING - Preconditioning the flock physiologically

Open housing - January 15 to June 15 (see guide Page 10)

1. Increase day length to 20 hours 4 to 6 weeks ahead of molt date. This causes the hens to be more receptive to the reduction in day length and makes it more effective.
2. Ten to 14 days ahead of the molt date, reduce the lights to the day length of the 33rd day of the molt. This apparently triggers hormone changes in the flock, causing the hens to stop laying more quickly after the feed is removed.

3. Increase lights 1 hour 3 to 4 days before layer diet is fed. It is better to stimulate egg production with lights before the layer diet is fed. Otherwise the increased nutrient level in a layer diet may be converted by the hen to unneeded fat.

Open housing - June 15 to January 15 (see guide Page 11)

1. Same as above except shorten day length (step 2) to natural daylight.

Controlled light housing

1. Same as above except omit step 1 and reduce the lights (step 2) by at least 6 hours.

FEEDING PHASE I - Preparing the flock for the molt.

1. Feed oxytetracycline (terramycin) at 50 gm/ton feed in the last load of layer diet and the first load of molt diet. Any broad-spectrum antibiotic will help reduce the stress. However, research has indicated that this particular antibiotic also may improve egg shell quality later.
2. Feed 4-6 lbs. of oyster shell per 100 hens on top of the last feeding of layer diet to help prevent cage fatigue and soft-shelled eggs.

FEEDING PHASE II - Preparing the flock to lay.

1. Feed a molt diet until about the 33rd day (see guide). Use a diet that contains 14% protein equivalent, 1% calcium, 0.45% available phosphorous, and between 1300 and 1260 Kcal/lb M.E. during cold weather. Drop the energy during hot weather to between 1260 and 1230 Kcal M.E.
2. Change the molt diet to contain 2.5% calcium ($\frac{1}{2}$ from oyster shell) between the onset of production (first eggs) and 10% production. Then change to a layer diet containing 17% protein equivalent until 1-2 weeks after peak production.

3. Feed a 16% protein equivalent diet until 66%-69% production unless large egg size is a problem. Many times, egg size can be reduced without affecting the rate of production by lowering the protein level. Seek the aid of the nutritionist who formulated the diet you are using before changing protein to change egg size.
4. Feed a 15% protein-equivalent diet when production drops below 65%, or sooner if needed to control egg size. Timing the changes in protein level should be related to the cost of feed protein. If protein cost is high, it can pay to change at a production level above 65%.
5. All changes must be made only after considering how well the flock is performing.
6. Flocks may be molted very successfully on a diet of cracked grain such as barley, oats, milo, or corn. The nutrients in oats or barley and their lower energy tend to make them preferable to milo or corn. It is usually advisable to add vitamins and trace minerals plus calcium and phosphorous to a cracked grain diet when molting cage layers. Consult your nutritionist.
7. Certain feeding systems may not be capable of feeding only 8 to 10 lbs. of feed per 100 birds each day as called for in the attached guides. In this case, it may be advisable to feed 16-20 lbs. every other day until the 19th day. If your feeding system has other limitations, ask us for advice.

WATER

1. It usually is not necessary to restrict water when a flock has been preconditioned with light changes.
2. Restriction may be necessary with a flock in strong production before the molt. As a guide, production should be approaching zero by the 5th day. If not, water restriction may be needed.

3. If necessary, restrict only after all feed has been digested and then only before noon for no more than two days. Watch closely for the effects of heat during hot weather.

MORTALITY

The rate of mortality during a molt varies by such factors as the health and vigor of the flock, season of the year, age of the flock, and the flock's previous mortality rate. If the culls are not removed before the molt, the mortality rate will be hard to predict except to say it will be considerably higher than the pre-molt rate, especially the first 14 days.

A properly culled flock should only have a very moderate rise in mortality during the first 14 days. Some flocks will have no increase at all from the pre-molt level. Occasionally, the mortality rate will rise sharply in the 24 hours following the first day a flock is fed after the withholding period. Exactly what causes this is not known although it appears to be aggravated by excessive heat.

The rate of mortality to be expected in a properly culled flock should not exceed 1% during the first 14 days. The rate during the entire molt should not exceed the pre-molt rate and should not be over 1% per month under ideal conditions. Under some conditions, a rate that is 0.5% per month higher than pre-molt may be acceptable. This would be true if all the factors mentioned earlier were not entirely favorable.

BODY WEIGHT

1. Each bird should lose about 20-25% of her body weight depending upon pre-molt conditions.
2. Birds in the flock should average near the normal 20-week-old weights for their strain (3 ± 0.1 lbs) when they reach their lowest body weight between 10 and 14 days. Much of this depends

upon their physical condition and the environmental temperature
A flock that is relatively light in weight before the molt may not
be able to loose as much weight as others. Watch for a decided
rise from the expected mortality which may indicate too much
weight loss.

3. Body weight is an important management tool used to monitor the progress of a flock. The weight guide given above is acceptable for most Leghorn type hens. In warmer weather, some flocks may slip as low as 2.5 lbs. without experiencing any difficulty.
4. Bring the flock into production with light stimulation rather than feed stimulation in order to control weight gains after onset of production following the molt.

CULLING

It is not absolutely necessary to cull a flock before molting them. However, culls usually will die first and, in so doing, may expose the healthy hens to low-grade infections during this period of physiological weakness. Removing the culls before the molt will usually result in a lower mortality during the molt and subsequent lay period. This allows the poultryman to use the mortality level as another management guide. Culling also reduces feed costs.

"HOW TO" KEYS

A good method of molting must: (1) be simple to use, (2) take the whole flock out of production quickly, (3) keep the flock out long enough to allow adequate rest, (4) return the flock to full production fairly rapidly on the desired schedule, (5) not cause excessive mortality, and (6) be relatively low in cost.

Body weight is the key to any successful molting program. Production is stopped by turning off or reducing the lights and removing feed (and water, if necessary). The lightest body weight is usually reached from 10 to 14

days after the molt is started. The flock then should regain about 0.5 pounds by the time 50 percent production is reached.

Details of molting guides are given on the next two pages for your use or for adaptation into your program. They are designed for Leghorn type hens. They can be used for larger hens by modifying body weights and amounts of feed to be fed. These guides are modified to compensate for the seasons when day-length is increasing (January-June) or decreasing (July-December). The environmental temperature is taken into account on the two feeding schedules. For answers to more detailed questions you may wish to contact your local Extension Office or the Extension Poultry Specialist for the commercial eggs in the Poultry Science Department at VPI & SU.

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<u>DAY</u>	<u>ACTION</u>
-38	Increase lights to 18 hours.
-31	Increase lights to 19 hours.
-24	Increase lights to 20 hours.
-24	Revaccinate for Newcastle and Bronchitis if deemed necessary by your veterinarian.
-10	Set light clocks to bracket the day length at 0+33 days. (This should prevent the need to restrict water.) Remove culls <u>before</u> feed runs out. The last load of layer diet should have an antibiotic added*.
0	Let feed bin run empty on this day. Clean bulk bin and discard stale feed material. Feed 5-6 lbs. oyster shell/100 hens on top of the <u>last</u> run of feed or else hand-scatter it in the trough to prevent cage fatigue and soft shelled eggs. Weigh about 50 hens and record weights.
+5	If egg production has not <u>approached</u> zero, remove water this morning till noon and tomorrow morning. Watch birds carefully in hot weather. Weight the same 50 hens and record. (Expect to lose <u>about</u> 0.5 - 0.6 lbs. by now.)
+7	Weigh hens. Body weight will probably average about 3.0 to 3.2 lbs.
+8	Feed 10 lbs. of molting diet per 100 hens. (see page 5)
+9	No feed today. Weigh hens. (average <u>about</u> 3.0 lbs.)
+10	Feed 10 lbs. of molting diet per 100 hens.
+11	No feed today. Weigh hens. If average weight has not reached about 3.0 lbs., no feed tomorrow either unless mortality rises excessively.(see pg. 6)
+12	Feed 10 lbs. of molt diet per 100 hens every day.
+13	Weigh hens. Expect slight increases (0.1 lb) in weight.
+19	Increase molt diet to 14 lbs. per 100 hens.
+26	Increase molt diet to 16 lbs. per 100 hens. Weigh hens. Should weigh about 3.45 lbs and no fat.
+33	Molt diet should contain about 2.5% calcium and at least 0.45% available phosphorous in it from now until 5-7% production. Half of this calcium needs to be as oyster shell. (see pg. 5, Feeding Phase-II).
+33	Increase feed to 18 lbs. per 100 hens. Add 1 hour lights in morning. Switch to 16 or 17% protein layer diet when birds reach 7 to 10% production.
+38	Increase feed to 20 lbs. per 100 hens. Add 1 hour in morning. Weigh hens.
+43	Full feed until peak production. It may be necessary to drop to 16% protein layer soon after peak production to control egg size.
+47	Add ½ hour in morning but not over 17 hours total or return to pre-molt lighting program.
+54	Add ½ hour lights in morning.

* Oxytetracycline (terramycin) at 50 gm/ton in the last load of layer diet before molting and at 100 gm/ton in the first load of molt diet is recommended to reduce mortality and help egg shell quality.

<u>DAY</u>	<u>ACTION</u>
-38	Increase lights to 18 hours.
-31	Increase lights to 19 hours (not necessary after Sept. 15).
-24	Increase lights to 20 hours (not necessary after Sept. 15).
-24	Revaccinate for Newcastle and Bronchitis if deemed necessary by your veterinarian.
-10	Turn off lights (this should prevent the need to restrict water). Remove culls <u>before</u> feed runs out. The last load of layer diet should have an antibiotic added*.
0	Let feed bin run empty on this day. Clean bulk bin and discard stale feed material. Feed 5-6 lbs. oyster shell per 100 hens on top of the <u>last</u> run of feed or else hand scatter it in the trough to prevent cage fatigue and soft-shelled eggs. Weigh about 50 hens and record weights.
+5	If egg production has not approached zero, remove water this morning till noon and maybe tomorrow morning. Watch birds carefully in extremely hot weather. Weigh <u>the same</u> 50 hens and record. (Expect to lose <u>about</u> 0.5 - 0.6 lbs. by now.)
+7	Weigh hens. Body weight will probably average about 3.0 to 3.2 lbs.
+8	Feed 8-10 lbs. of molting diet per 100 hens. (see page 5)
+9	No feed today. Weigh hens. (average <u>about</u> 3.0 lbs.)
+10	Feed 8-10 lbs. of molting diet per 100 hens.
+11	No feed today. Weigh hens. If average weight has not reached about 3.0 lbs., no feed tomorrow either unless mortality rises excessively. (see pg. 6)
+12	Feed 10 lbs. of molt diet per 100 hens every day.
+13	Weigh hens. Expect slight increase (0.1 lbs.) in weight.
+19	Increase molt diet to 14 lbs./100 hens. Weigh hens.
+26	Increase molt diet to 16 lbs./100 hens. Weigh hens. (about 3.45 lbs. & no fat)
+33	Molt diet should have about 2.5% calcium and at least 0.45 available phosphorous in it from now until 5-7% production. Half of this calcium needs to be as oyster shell. (see page 5, Feeding Phase-II)
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