

How to improve uniformity when grading of breeder pullets is not possible

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The techniques and economics of grading breeder pullets is a topic of much discussion in many companies.

Concerns over the cost of labour and equipment, as well as the time involved, are mentioned in the same conversation as the economic benefit of grading.

Much discussion does not advance beyond the talking stage. But almost everyone agrees that a breeder pullet flock which is very uniform in weight, frame size and sexual maturity at light stimulation age and onset of production will make it much easier to feed the birds into production, attain proper weights and allow feed to be reduced with least impact on persistency of lay.

A flock with poor uniformity has to be fed and managed to the group 'average', which will not suit the needs of lighter and heavier hens.

Grading programme

Among the perceived obstacles are:

- Technique – What type of grading is necessary? Do we need to handle every bird every time, or is a 'walk-through' grading by separating out the obviously larger or smaller birds adequate?

- How many times should the flock be graded?

- Is grading at one age better than another?

- What criteria should be included when grading the pullets into separate groups?

Inevitably, answers always come back to cost/benefit. The most complex programme involves four complete gradings (handling every bird) to be done by weight at seven days, four weeks, 12 weeks, and then a final grading by weight/body composition at 16-18 weeks.

For males, an additional grading at eight weeks is added. The cost per pullet is calculated in Table 1 for a flock size of 10,000 pullets and 1,500 males:

- US wage rate of \$11.50 per hour plus an additional 40% added for benefits costs; eight workers working eight hours for grading pullets, with five workers working four hours on the male grading.

- Equipment expense of two vehicles at 55 cents per mile, assuming a 50 mile round trip per grading and an additional 50% to cover needed equipment such as nets, curtains and scales.

- Payback in increased hatching eggs per hen housed (HE/HH), based on a value of 23.39 cents per hatching egg.

Is it possible to increase the performance of a flock by 2.77 HE/HH by grading? Cobb



Winning the track feeders.

completed hen flock results done on similar birds reared in Brazil with extensive grading compared to birds raised in the US with little or no grading, show an advantage to the graded flocks of 14.85 HE/HH for fast feathering and 14.30 for the slow feathering line!

The Brazilian management has long been recognised as being able to express fully the genetic potential of the breed. Grading is a large part of that, as the housing, feeding systems and rations are very similar to those in the US.

Alternative programmes

Recognising that labour costs are constantly getting higher, companies are looking for ways to reduce grading costs but retain much of the benefit. Certain grading ages are more important than others. The one that could be dropped with the least negative impact is at eight weeks.

The most benefit seems to come with the earliest gradings – seven days and four weeks – as this is the age where the frame size is established. Weight uniformity could be reduced as the flock is reared, but skeletal uniformity is established in the first four weeks and weight uniformity will be regained in the production farm.

A 12 week grading is also important, as this is just at the onset of sexual development, when accurate feeding to the needs of each group of birds can be

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Table 1. The cost of grading per pullet for a flock of 10,000 pullets and 1,500 males.

	Pullets	Males
Birds per flock	10,000	1,500
Salary and benefits/hour/employee (\$)	16.10	16.10
Hours needed to grade birds	8	4
Cost/employees (\$)	128.80	64.40
Number of employees needed	8	5
Labour cost for grading (\$)	1,030.40	322.00
Equipment cost/grading (\$)	82.50	82.50
Number of gradings	4	5
Total spent/grading (\$)	4,451.60	2,022.50
Total spent per flock (\$)	6,474.10	
Cost per pullet for grading (\$)	0.647	
HE per hen needed for payback (\$23.39 cents each)	2.77	

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attained. A grading by body composition at 16 weeks may not be necessary if previous gradings have been successful.

Regardless of the number of gradings, it is recognised that birds have varied eating habits. Timid birds which become the smaller birds in a flock will probably always be timid; grading puts these birds together with like birds instead of making them compete with the more aggressive flock mates.

Subsequent gradings may end up with mostly the same birds in pens together. Experience has shown that birds in the more timid pens can take much longer to eat the same amount of feed as the larger, more aggressive birds. The best and most thorough grading procedures will be a waste of time and money without the proper rearing techniques. If a location decides it is not practical to do pullet grading, other steps must be taken to achieve the best uniformity.

Feed formulation

The amount of crude protein (CP) consumed in the first 28 days is critical to frame development. Research has shown that a minimum of 180g per pullet of CP by four weeks of age is needed for proper development (Table 2).

In this trial, the bottom 25% (by pullet weight) which consumed the least protein was only 62% of the average weight of the same group and less than half the weight of the bottom 25% fed the most CP.

They had already lost their weight and skeletal uniformity which could not be recovered later with feed or management techniques. The lack of CP could be from too low protein in the feed formulation or feed form (for example, pelleting and crumbling the feed which lessens the feeding time through faster consumption), not enough light hours or intensity to allow chicks enough opportunity for feeding, or feeder space and delivery problems.

Any one of these items can ruin a flock within the first four weeks. In addition, the time available to have feed in front of the birds can be lengthened by feeding a lower energy mash which increases the volume available.

Training the birds

It is widely accepted that flock uniformity is affected by the eating habits of individual birds. The aggressive birds will eat more, and gain weight faster than timid birds. The weight dispersion gets wider as this flock becomes older — the heavier and more aggressive birds continue to crowd out their smaller flock mates. A technique that has worked well is to train the birds not to be aggressive by filling the feeders in the dark and then as soon as the feed has the track

Cumulative protein (g)	Average BW	CV	Body weight bottom (25%)
209	540	11	462
178	479	13	399
164	431	20	319
159	426	25	288
149	409	29	257
140	394	23	278
136	387	25	264
127	368	30	230

Table 2. The amount of crude protein needed for proper development (Dr R. Teeter, Oklahoma State University).

or pans full, turn on the lights. But this must be done very early in the flock's life. The birds 'learn' that they do not need to crowd where the feed comes out, but rather when the lights come on, the feed is there in front of them. They never learn that they have to be aggressive to get their share.

Feeder systems

There are two items in feed delivery systems to consider – feeder space per bird and feed delivery times.

Feeder space per bird is dependent on the type of feeder, but it is important to ensure all the birds have a place to eat at the same time. Watching the birds eat from the time the lights come on is important in knowing if the feeder space is adequate.

When birds are seen running to different areas along the system and jumping on to the backs of other birds to get something to eat, there is obviously not enough space.

House and equipment design can help or harm uniformity. When balancing feeder space with floor space per bird, a longer, narrower house allows more feeder length for a given area of floor space. But this increases housing cost, and extends the time necessary to deliver the feed to the full system.

For a given requirement of floor space per pullet, a wider house with additional lines of feeders can accomplish the same thing.

An extra line or loop also allows better management by not utilising the last line of feeders until needed.

For example, with three loops of chain/trough feeders, the last of the three may not be necessary until the feed amount is able to fill all lines – sometimes at around 8-10 weeks of age.

Total feeder space needs to be calculated based on the size of the pullets at moving time, which should be the largest size during rearing. However, even if there is enough space but the delivery system does not place the feed in front of the birds quickly, then it is almost the same as not having enough space.

The parts of the feed lines with no feed are wasted areas and the birds will naturally crowd to where feed is available. Generally, 15cm (6.0 inches) of linear space per bird is

recommended for trough feeders, and 11.5cm (4.5 inches) is adequate with a pan system.

Having the feeders properly 'charged' before feeding is critical. A system that can be winched above the birds' reach after feeding allows the feeder to be refilled completely before being lowered for the next feeding. This is especially important with a pan feeder system where the manager cannot see the location of the feed in the fill tubes when the day's feeding is completed.

Raise the feeders only after all of the feed had been emptied into the pans and consumed, and then the feeders are refilled all the way to the end pan before lowering the system at the next feeding.

This helps keep the birds calm, but also ensures that the correct amount of feed is eaten each time, as there will be no day-to-day difference in the amount of feed remaining in the tubes.

With a chain/trough feeder, a system of auxiliary 'dummy' hoppers placed along the length of the track gets the feed in front of the birds much faster, avoiding pile-ups at the hopper.

These smaller hoppers can be filled manually or mechanically after each feeding, and need only to contain enough feed to fill the trough to the next hopper at the beginning of feeding. After that, the chain can be kept full by cycling often until the complete ration is eaten.

Winching the track feeders as described for a pan system works best. If that is not possible, dummy hoppers used in conjunction with running the first filling in the dark or when using 'signal light' feeding is the next best method.

'Signal light' employs a low intensity light at the far ends of the houses, which is left on while the feeder fills with all other lights off.

This draws the birds towards the light and away from the centre hopper, reducing or eliminating piling. The ideal goal is to have the feed in front of all the birds at once. As an absolute minimum, feed should cover the entire track or have feed in every pan within two minutes of the start of feeding.

Whether grading is utilised or not, proper management of the feeding systems is critical to maintain the best possible uniformity. ■