

Grading of Broiler Breeders

Introduction

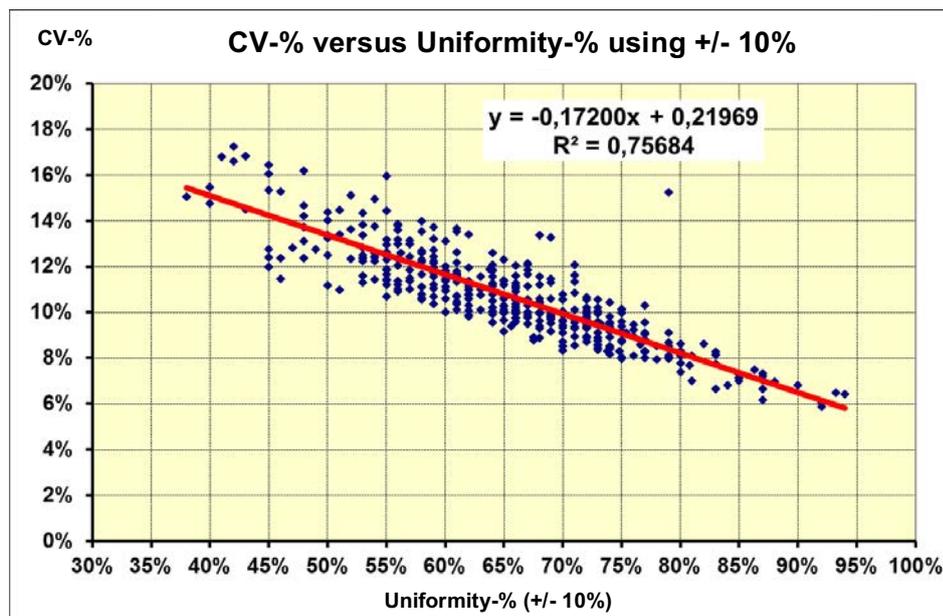
During the rearing period, it is the objective to obtain breeders able to express their genetic production potential in terms of number of hatching eggs and chicks produced per hen housed.

In addition to good flock management, the growth and uniformity of the breeders in rear are important factors to control.

The objective is that all the birds in the flock have reached a satisfactory physiological development at the beginning of production. The flock will then be easier to manage (more efficient light stimulation, better feed management, etc.).

In order for each individual to have a similar growth profile, uniformity is an important criterion to be managed from the start (starting conditions, equipment, feed/feeding, etc.).

Weight control begins as early as the first week and uniformity is assessed at 2-3 weeks either by calculating the % of uniformity (% of animals in the range +/- 10% of the average weight) or by the Coefficient of Variation (CV = standard deviation/mean) which more precisely measures the spread of the weights relative to the average. For a uniformity of 60% for example, the CV can vary from 10 to 13% (see graph below).



Approximative correspondance CV / Uniformity	
CV (%)	Uniformity (%)
5	97
6	92
7	87
8	80
9	75
10	70
11	65
12	60
13	55
14	47
15	40

The CV is often calculated by electronic scales. In other situations, it can be calculated using the Hubbard recording program.

The evaluation of the CV can be done during the week before the day of the selection to decide to use 2 or 3 weight categories and to plan the material needed for the partitions accordingly.

Grading of the birds is highly recommended to be done as soon as possible and no later than at 4 weeks of age. The objective is to separate the light birds as a matter of priority so that they will have recovered their growth retardation at around 10 weeks, at which time the development of the skeleton is practically complete.

Two possible situations:

- 1- If the CV is less than 12%, make 2 weight categories (light and medium)
- 2- If the CV is >12% (this equals about <60% uniformity) it is desirable to use 3 weight categories (light, medium, heavy).

If during the rearing period the uniformity goes down, another grading may be useful. Nevertheless, it is important to investigate the causes. For males, it is desirable to plan it anyway around 13-14 weeks in order to ensure good growth between 14 and 22-23 weeks to promote testicular development. It will be possible to evaluate the maturity of the males more precisely around 17-18 weeks of age: the less developed males normally will be eliminated (or otherwise separated in a specific selection pen if you want to try to recover some of them).

How to perform an effective grading?

The goal is to achieve a uniformity > 80% in each weight pen after the grading.

If equipment and design of the houses permit, it may be beneficial to provide a free surface during the starting period to accommodate light birds and heavy birds (if required) at the time of grading. This area should represent about 20% of the total surface for the smaller birds and the same for the larger ones if the option with 3 weight categories is chosen.

Step 1: Evaluate precisely the uniformity of the flock on the day of grading (fasting).

First, check the accuracy of the weighing system using a standard weight (1 kg).

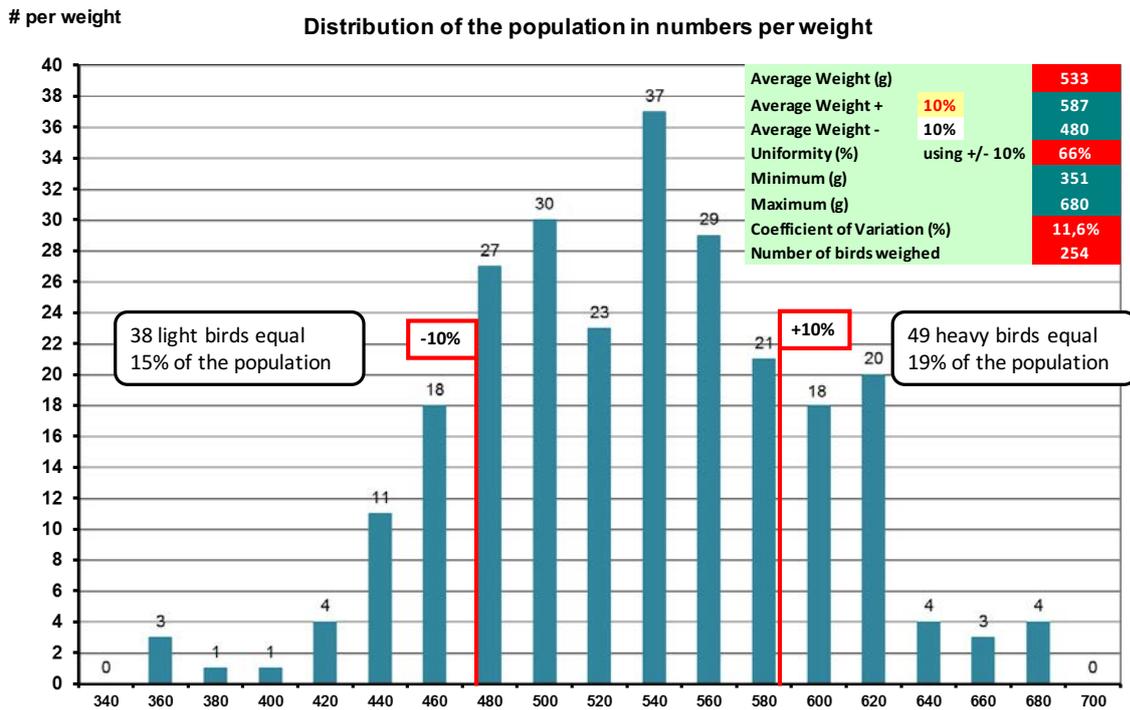
Weigh a representative sample of the flock. Ensure that all birds in a pen of at least a hundred birds are weighed. If the house is composed of several pens, a sample from each pen must be weighed in order to know precisely the average weight and the uniformity of the birds in the whole building.

Calculate average weight, uniformity (% of animals in the range +/- 10% of the average weight) and CV. Below is an example of a pre-grading weighing result with two types of scales:

1. *Results with an electronic scale (accuracy to 1 gram):*

Average Weight (g)			529
Average Weight (g)	+10%		581
Average Weight (g)	-10%		476
Uniformity (%)	using	+/- 10%	62%
Minimum (g)			351
Maximum (g)			680
Coefficient of Variation (%)			12%
Number of birds weighed			254

2. Results with a manual scale (20g weight interval):



In the example above, the CV is close to 12%. It can therefore be considered that it is necessary to choose a grading into 3 categories.

1st situation:

If the surface of the pens can be modified, the grading is done according to the upper limit (average weight +10%) and lower limit (average weight -10%). In the above example, depending on the precision of the scale, the weight of the lighter birds will be less than 470-480g (lower limit) and the heavier birds will have a weight greater than 580g (upper limit).

Depending on the actual number of lighter and heavier birds after grading, the allocated area may be modified to accommodate the density and feeder space in each pen.

2nd situation:

If the surface of each pen is fixed, the number of birds (% of light and heavy in case 3 categories are chosen) should be calculated in relation to the density and the feeder space.

If the weighing is carried out using an electronic scale, it is necessary to record the individual weights either on a weighing sheet or on a computer spreadsheet available from your Hubbard technician. It is preferable to use weight intervals of 10g (better accuracy).

The lower and upper limits to indicate if the birds are too light or too heavy will then have to be modified according to the number of birds that can be placed in each pen. The goal is to be as close as possible to the +/- 10% limits, so that grading is most effective.

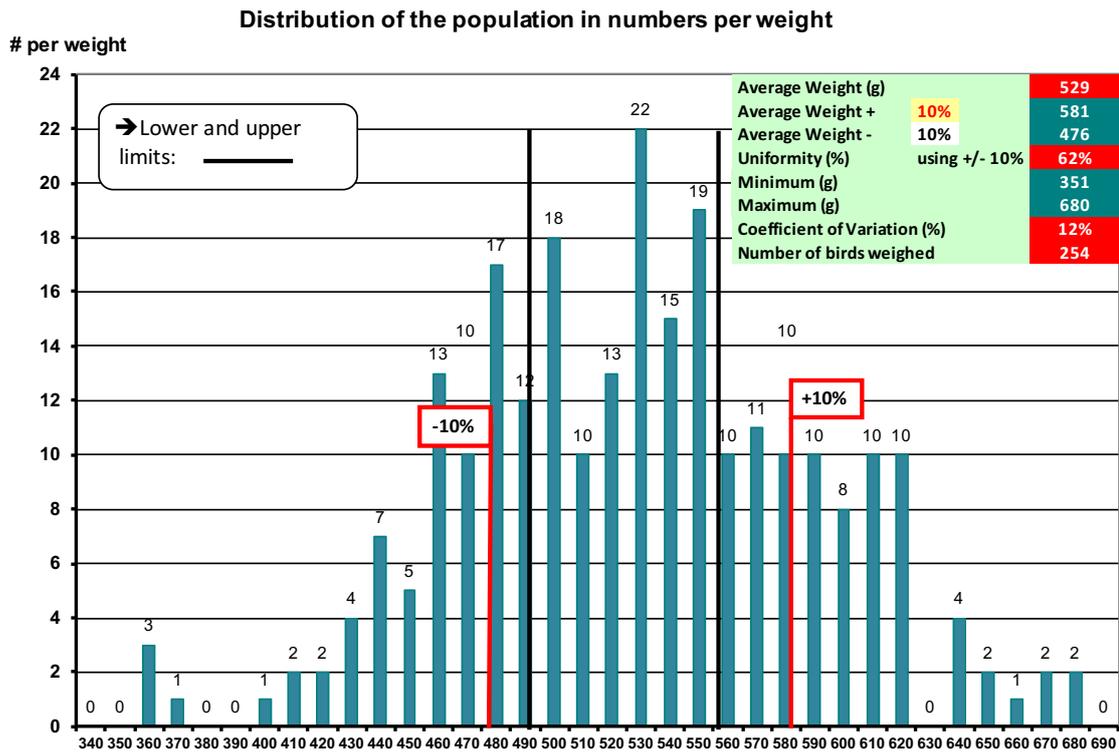
In the example of a house made up of three identical pens, the space allocated for each weight category will therefore be one third of the building. As shown in the two histograms below (black bars), the lower and higher limits will be:

- Interval of 10g: 490g and 560g
- Interval of 20g: 500g and 580g

Given the fact that it is difficult to obtain the exact number of light and heavy birds required for each pen, it is useful to be able to separate a group of birds whose weight is close to the lower and upper limits in a "buffer" pen in order to be able to adjust the number of birds in each pen at the end of the operation.

E.g.: If the lower limit is 490g, birds weighing 500g will be placed separately in a "buffer" pen. If the upper limit is 560g, animals weighing 550g will be set aside in this "buffer" pen.

Histogram with a weight interval of 10g:



Histogram with a weight interval of 20g:



Step 2: Organisation of the grading

It is important to perform this procedure accurately so that the result is effective.

Let us take the example of a flock to be calibrated in 3 categories (light, medium and heavy).

All animals must be weighed. Below are three examples of scales for performing the grading.



Kitchen scale (grading before 3 weeks of age)



Electronic scale



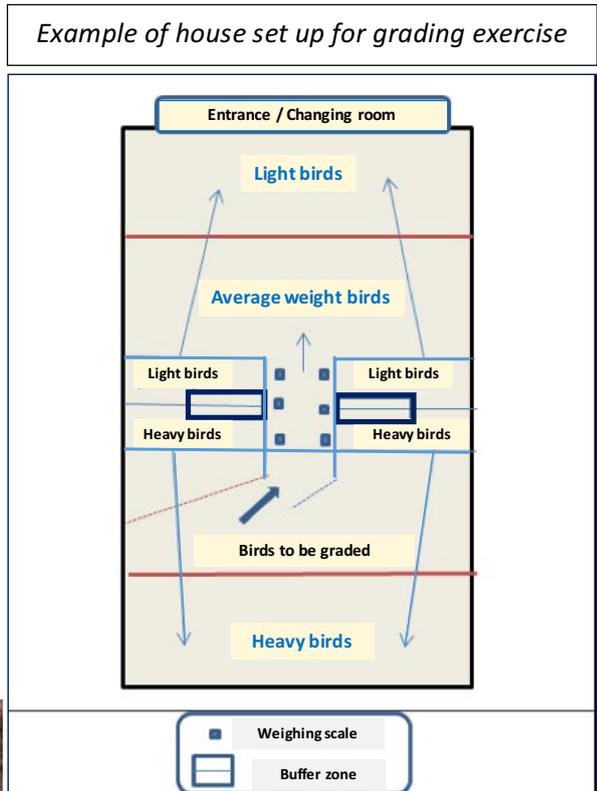
Manual scale

P = Light birds
G = Heavy birds

Plan to use 4 to 6 scales according to the number to be graded, i.e. 4 to 6 people (weighers) + 1 person per weigher to catch and transmit the birds. In total, it is therefore necessary to count at least between 8 and 12 people for the whole operation.

Time needed: for a precise grading exercise (including sample weighing, setting up the pens and counting the birds) about 200-250 birds/ hour/weigher will be able to be handled.

The number of light and heavy birds which are placed in their respective pens must be counted very precisely.



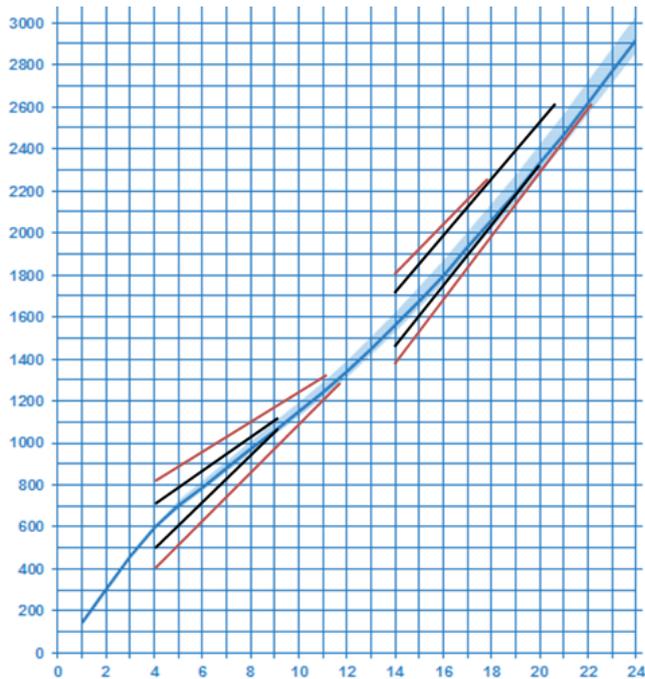
In order to secure a soft landing of the birds on the litter, it is recommended to use some kind of "slides" as illustrated below.

Flock management after grading

After the grading has been completed, recalculate the feeding and drinking space per bird for each pen.

During the week following grading, use the same feed level for all the pens as before the grading. Then, the feed level has to be adjusted according to the growth of each weight category. A few extra grams will mostly be needed for the lighter birds.

The ideal is to have independent feeding systems per pen. If this is not the case, the additional feed needs to be distributed manually. It may be useful to give the extra feed not on a daily basis, but for example only twice a week (= total additional feed for a week/2) so that the distribution of the feed in the different pens is more practical and more precise.



Legend:

- Weight > 100g lower or higher than the target
- Weight < 100g lower or higher than the target
- Target Weight of a standard breeder female

Grading at 4 weeks:

For birds < 100g lighter or heavier than the target bodyweight: **reach target weight around 9 weeks of age**

For birds > 100g lighter or heavier than the target bodyweight: **reach target weight around 12 weeks of age**

Grading at 13/14 weeks:

For birds < 100g lighter than the target bodyweight: **reach target weight around 20 weeks of age**

For birds > 100g lighter than the target bodyweight: **reach target weight around 22 weeks of age**

For birds < 100g heavier than the target bodyweight: **maintain the bodyweight parallel to the target weight curve**

For birds > 100g heavier than the target bodyweight: **reach a weight not heavier than 100g above the target weight around 18 weeks of age, then stay parallel to the target weight curve.**

Note: For the males ensure growth of at least 150g/week between 15 and 22 weeks of age.