GRADING OF BROILER BREEDERS

CONVENTIONAL AND PREMIUM BREEDS

During the rearing period, a key objective is to prepare the breeder females and also the males to be able to express their genetic production potential in terms of number of hatching eggs, fertility and chicks produced per hen housed.

In addition to good flock management, the growth and uniformity of the breeders in rear are key factors to control on a weekly basis to reach the performance objectives of the breed.

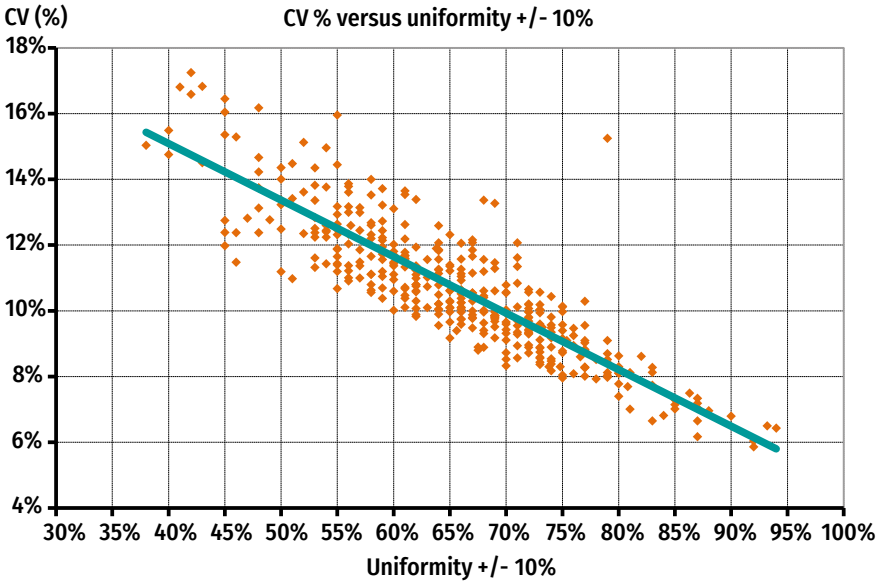
The target for the rearing period is to ensure all the birds in the flock have reached a satisfactory physiological development at the time of the first light stimulation. The flock will then be easier to manage with a more efficient light stimulation and a better feed management.

In order for as many individuals as possible to have a similar growth profile, flock uniformity is an important criterion to be managed from the start (brooding conditions, equipment, quality of the feed distribution, feed presentation).

HOW TO ASSESS FLOCK UNIFORMITY?

Bodyweight control begins from the first week of life. Uniformity is assessed from 2 weeks either by calculating:

- the % of uniformity (% of animals in the range +/-10% of the average weight);
- the Coefficient of Variation (CV=100* standard deviation/ mean) which more precisely measures the spread of the weights relative to the average. For an uniformity of 60% for example, the CV can vary from 10 to 14% (See graph on the right). The CV is often calculated by electronic scales. In other situations, it can be calculated using the Hubbard recording program or table on the right.



Relationship between CV and uniformity												
	CV (%)	5	6	7	8	9	10	11	12	13	14	15
	Uniformity (%)	97	92	87	80	75	70	65	60	55	47	40

Correlation between uniformity and coefficient of variation

DEFINITION OF THE GRADING

Grading of the birds is highly recommended to be undertaken 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 lost growth to achieve the bodyweight targets 4 weeks after grading and no later than 8 weeks of age, at which time the development of the skeleton is practically completed.

Example of a grading procedure

The objective of the grading is that each group reaches at least 85% uniformity (CV=7.5%) once the procedure is completed.

If after the first grading the uniformity goes down and is less than 80% (CV=8%), it is recommended to re-grade the flock between 12 to 14 weeks to ensure that each group achieves at least 85% uniformity (CV=7%). Nevertheless, it is also important to investigate the causes of the uniformity decrease.

For males, it is recommended to plan to re-grade the flock around 13-14 weeks to ensure good growth between 14 and 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 and provide the less developed males a specific selection pen if you want to try to recover growth and maturity.

HOW TO PREPARE THE GRADING?

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

Two possible situations:

1. If the CV is lower than 10% (> 70% uniformity), make 2 weight categories (light and medium).
2. If the CV is higher than 10% (< 70% uniformity) it is preferred to use 3 weight categories (light, medium, heavy).

If equipment and design of the houses permit, it may be beneficial to provide a free unused surface in the house during the starting period in order to be able 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.

HOW TO PERFORM AN EFFECTIVE GRADING?

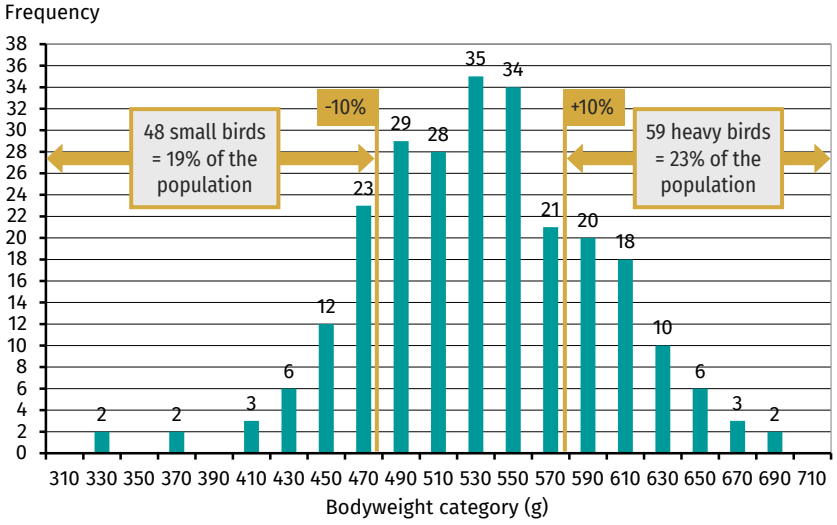
➨ Step 1: Evaluate precisely the flock uniformity on the day of grading (bodyweight without feed).

1. Check the accuracy of the weighing system using a calibration weight as heavy as the birds to be graded (1-3 kg).

Weigh a representative sample (3-5% of the flock and at least 100 birds per pen). Please refer to the ***"Parent Stock Guide"*** for more information about the weighing procedure. If the weighing is carried out using an electronic scale, it is necessary to record the individual bodyweights either on a weighing sheet or on a computer spreadsheet available from your Hubbard technician. It is preferable to use weight intervals of less than 10 g for a better accuracy.

If the house has several pens, a sample from each pen must be weighed in order to know precisely the average weight and the uniformity of the whole flock. It is also possible to remove the partitions between the pens before weighing the sample.

Sample size	254
Average Bodyweight (g)	525
Average Bodyweight +10% (g)	578
Average Bodyweight -10% (g)	473
Uniformity +/-10%	61%
Coefficient of Variation	10.8%



Bodyweight distribution with an electronic manual scale (20 g weight interval)

2. Calculate average bodyweight, uniformity (% of animals in the range +/-10% of the average weight) and CV. The figure on page 2 is an example of a pre-grading weighing result undertaken with an electronic manual scale.
3. Set the lower and the upper limits.

In the example above, the CV is above 10%. It is necessary to choose a grading into 3 bodyweight categories (light, medium, heavy).

➨ **1st situation: Adjustable pen size**

The grading is done according to the upper limit (average weight +10%) and lower limit (average weight -10%). In the above example, the bodyweight of the lighter birds will be less than 480 g (lower limit) and the heavier birds will have a bodyweight greater than 580 g (upper limit).

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

➨ **2nd situation: Fixed pen size**

The number of birds (% of light and heavy birds in case 3 categories are chosen) should be calculated in relation to the stocking density and the feeding space.

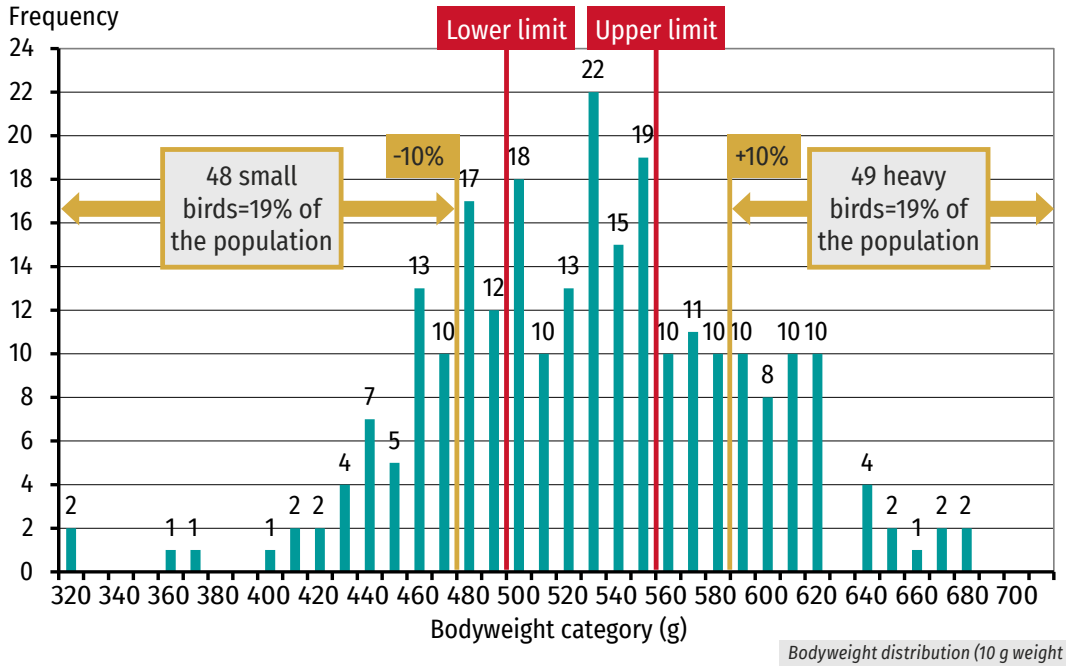
The lower and upper limits will be defined according to the number of birds that can be placed in each pen. The goal is to be as close as possible to the +/-10% limits, so that the grading stays efficient.

In the example of a house made up of 3 identical pens, the space allocated for each bodyweight category will therefore be one third of the building. As shown in the histogram below (vertical red lines), the lower and upper limits will be respectively 490 g and 550 g.

➨ **Importance of the "buffer" pen**

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 temporary "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 490 g, birds weighing 490-500 g will be placed separately in a "buffer" pen. If the upper limit is 550 g, animals weighing 540-550 g will be set aside in this "buffer" pen.



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Bodyweight distribution (10 g weight interval) – Situation with fixed pen size

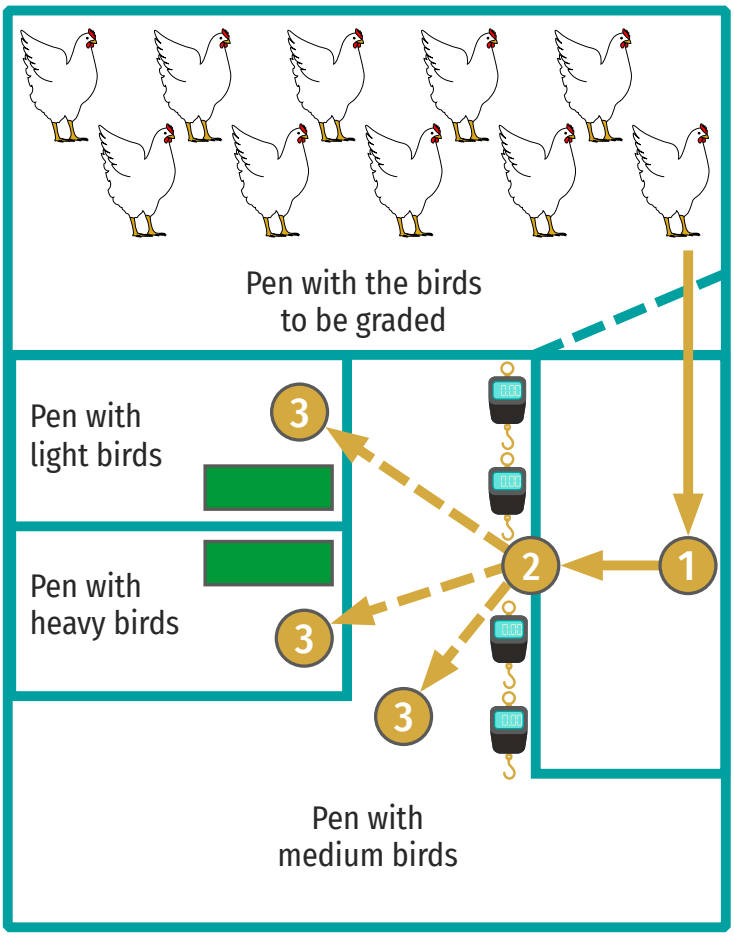
HOW TO PERFORM AN EFFECTIVE GRADING?

➡ Step 2: Organization of the grading.

It is important to perform this procedure accurately to get optimal flock uniformity results.

The following is the example of a flock to be calibrated in 3 weight categories (light, medium and heavy).

- All animals must be weighed. Below are two examples of weighing scales for performing the grading.
- Plan to use 4 to 6 scales according to the number of birds to be graded, i.e. 4 to 6 people (weighers) + 1 person per weigher to catch and give the birds. Also consider 2 persons to move and count the light and the heavy birds. In total, at least 10 to 14 people are needed for the whole operation.
- Time needed: for a precise grading exercise (including sample weighing, setting up the pens and counting the birds) about 250-300 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 or a mound of wood shaving approximately 30 cm high.



1. Catching pen before individual weighing
2. Individual weighing
3. Bird moved to the weigh pen according to its bodyweight

Scale

Buffer pen

Manual scale

Electronic scale

Slides to promote animal welfare

Some automatic grading machines for broiler breeder are also available in the market. Some solutions as shown on the right picture combine a vaccination process and a grading in one step. Practically, more than 2000 birds can be graded and vaccinated per hour with 4 people including setup and herding the birds (AAT, 2023).

Example of an automatic grading machine (Source AAT; Grady 3001)

FLOCK MANAGEMENT AFTER GRADING

➨ After the grading has been completed, weigh the birds in each pen and recalculate the feeding and drinking space per bird for each pen and make sure that they are in line with the Hubbard recommendations.

➨ After the grading the aim is to maintain or improve flock uniformity by having a close follow up of the feed distribution. ➔ See Poster ***"Feed distribution"***. Visual grading could continue after the final grading to maintain and/or improve flock uniformity.

➨ The weekly follow up of the flock uniformity is a key point to draw the trend in each pen (chart below available in the performance summary of each breed).

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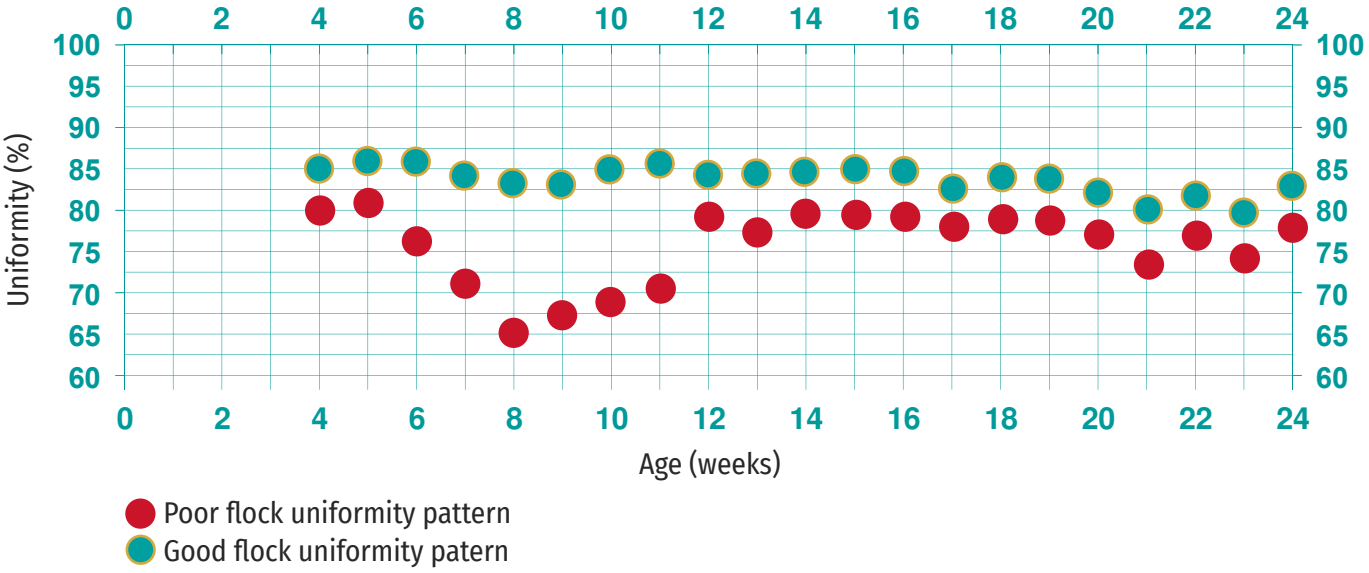
Poster
Feed distribution

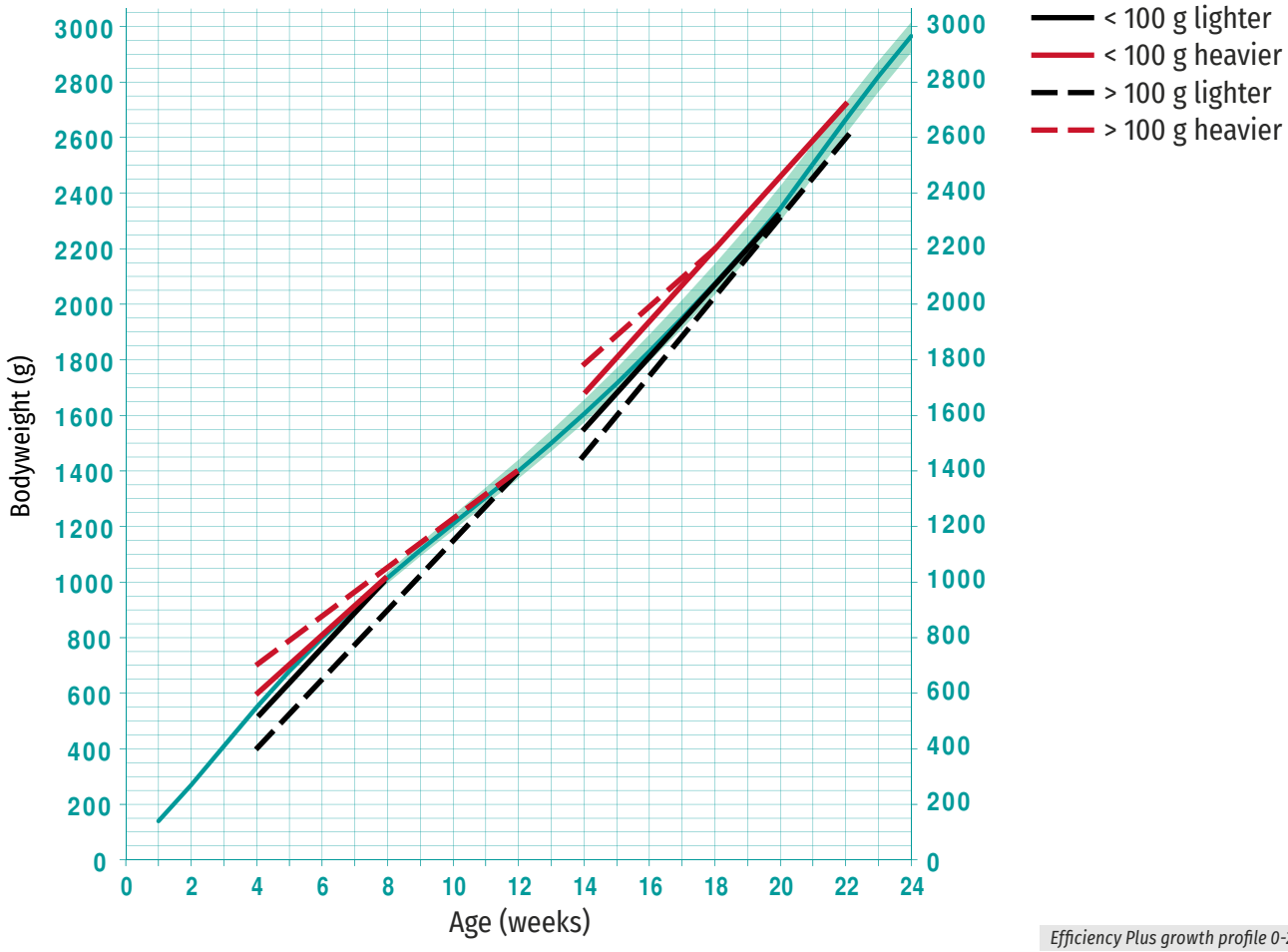


Flock uniformity pattern

➨ Feed ration management:

- ⇨ During the week following grading, use the same feed level for all the pens as before the grading. A few extra grams of feed will usually be needed for the lighter birds and few less grams of feed for the heavier birds. Then, the feed level must be adjusted according to the growth of each weight category.
- ⇨ The ideal situation 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 feed distribution in the pens is more practical and more precise.

➡ Bodyweight objectives after the gradings: table and graph below.



Efficiency Plus growth profile 0-24 weeks

ACTUAL BODYWEIGHT VERSUS BODYWEIGHT OBJECTIVE		<100 g lighter	<100 g heavier	>100 g lighter	>100 g heavier
OBJECTIVE AFTER THE GRADING	AT 4 WEEKS	Reach target weight around 8 weeks of age		Reach target weight around 12 weeks of age	
	AT 12-14 WEEKS	Reach target weight around 20 weeks of age	Maintain the bodyweight parallel to the target weight curve	Reach target weight around 22 weeks of age	Reach a weight not heavier than 100g above the target weight around 18 weeks of age, then stay parallel to the target weight curve

Source: AAT, 2023 : https://www.agri-at.com/en/products/grading-devices

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