

Flock Uniformity – A Key Factor for High Performance

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Introduction

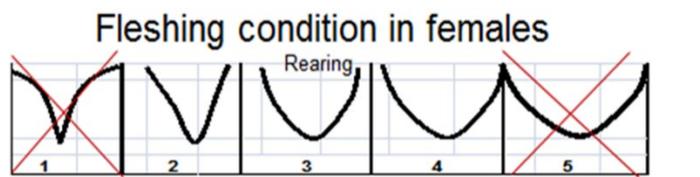
Cobb's pedigree breeding program is continuously improving commercial parent and broiler stock. Broilers and breeders are more feed efficient which means less nutrients are required to achieve the same body weight. Feed intake is controlled for breeders so it is more challenging to achieve and maintain a high uniformity. However, uniformity is one of the key factors to maximize their reproductive genetic potential. Uniform flocks reach peak egg production earlier, peak higher and persist longer than non-uniform flocks. High variation in sexual maturity, associated with under-weight and heavy females, will delay the onset of production or females may come into production but persistence is drastically shortened.

Uniformity explained

Ideally, every bird in a flock would have exactly the same weight and conformation so that when the flock is photo stimulated at 21 weeks they would all respond the same. Of course this is not the case as genetic and environmental variation cause flock variation. Uniformity is determined by weighing 1-2% of the birds individually and per pen. Begin by partitioning a portion of birds (at least 60) and weigh all birds in the partition. Use these weights to determine body weight uniformity expressed as uniformity percentage or coefficient of variation (CV). An ideal uniformity (+10%) is 80% or higher or CV lower than eight. By 12 weeks of age, 90% of the skeletal frame is developed and the uniformity should be as high as possible. After 12 weeks puberty begins and body composition is a more suitable measurement for uniformity (Figure 1).

Figure 1: Fleshing and fat objectives for Cobb500FF pullets

Week	Fleshing Score				Pelvic fat
	#2	#3	#4	Total #3 + #4	
12	70%	30%		30%	
16	40%	60%		60%	
19	<10%	60%	30%	90%	>65%
20	<5%	60%	35%	95%	>75%
21		60%	40%	100%	>85%
22		60%	40%	100%	>90%



Objectives for Fleshing & Pelvic Fat

Uniformity in frame size

In order to achieve uniformity at 12, weeks important rearing factors that influence uniformity must be considered:

- Brooding: within 24 hours 95% of all birds should have feed and water in their crop. Perform crop fill test on at least 100 birds.
- Feed space: when chain feeding provide the correct feeder space for each age (Table 1). Too much or too little feed space will harm uniformity. A good tool to control feed intake is to regularly check the crop fill. After feeding, the crop size should be similar between the birds. Large differences in crop fill indicate issues with feed space or distribution.
- Feed distribution: feed should be distributed in the dark and within 3 minutes, so that all birds can eat at the same time.
- Feeder equipment height: ensure that all birds are able to eat comfortably.
- Feed structure and volume: pellet feed will be consumed more quickly than mash feed. Diluted feed increases feed volumes and slows feeding time which helps maintain higher uniformity.
- Water availability: water should be distributed within 3 minutes. Use a water flow meter to assure that water flow in the front and end of the line is similar.
- Bird density: high bird density has a negative impact on uniformity.
- Heath status of the flock: diseases can harm birds and disrupt uniformity.

Table 1: Feed space by age using chain feeding

Week	Feed space (minimum)
1-4 weeks	5 cm
5-8 weeks	8 cm
9-12 weeks	12 cm
13-20 weeks	15 cm

The importance of body weight control and grading

Beginning at 2 weeks, body weight must be controlled by feed restriction. Feed restriction can contribute to uniformity differences since the more competitive eaters will consume more feed and grow more quickly than passive eaters. As noted in the previous section, there are several solutions to control uniformity problems caused by feed restriction. It is very important to have the flock at the correct weight and uniformity by 4 weeks with a maximum of 5% above standard. Correct weights and high uniformity at 4 weeks of age will prevent severe feed restrictions or higher feed amounts. An important tool to improve uniformity is grading. Grading is the process of taking the weights from sorting individual bird weights into categories (super light, light, average, heavy) so that birds within respective categories can be managed back to standard. Sorting birds into categories can be done after taking individual weights for uniformity and CV calculations as described in the uniformity explained section. Preferably, the first grading should be done at one week and later at four, eight and 12 weeks of age. Again, the goal is to achieve a uniform body weight and frame size by 12 weeks. See Cobb's Breeder Supplement Guides for specific growth recommendations for each product (<https://www.cobb-vantress.com/resource/product-guides>).

Uniformity at moment of light stimulation

To achieve a uniform response to photostimulation the flock should have a uniform body weight and physical composition. At transfer to the production house, all birds must find feed and water within 24 hours to avoid condition loss and uniformity problems. Photostimulation should be initiated between 147-154 days based on fleshing conditions and pelvic fat (Table 2).

Guidelines to determine Cobb500FF pullets readiness for photostimulation :

- Uniform in body weight, low CV (8) and high uniformity (+/- 10%) > 80%
- Average body weight between 2400 – 2500 gram (dry weight)
- 100% of the hens have a fleshing score of # 3 or # 4
- > 85% of hens with appropriate pelvic fat (Figure 2, photo B)
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Flocks with low uniformity at photostimulation are prone to the following problems:

- Lower peak production and persistency
- Higher mortality
- Cannibalism
- Double yolks
- Lower egg uniformity

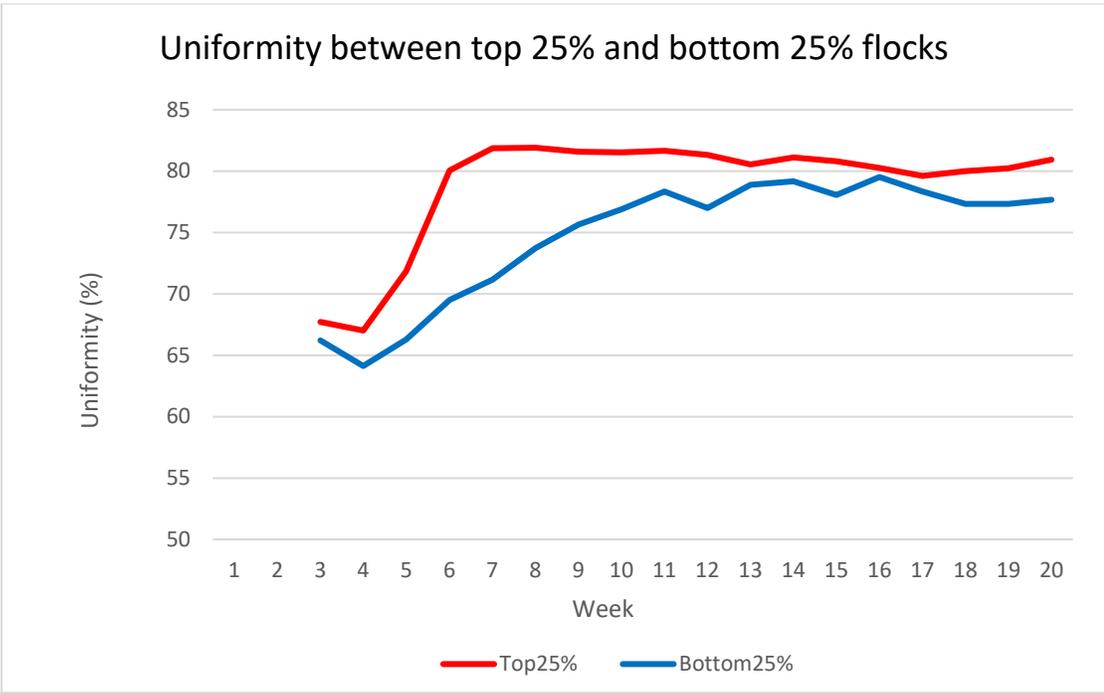
Table 2. Timing of light stimulation based on fleshing conditions and pelvic fat.

Timing of Light Stimulation (Dry Weight)			
Days of Age	BW 500FF	BW 500SF	Hen Condition
147	2400-2500	2500-2600	Proper fleshing condition and pelvic fat
147	>2600	>2700	Light stimulation should happen even if pelvic fat is <90%
154	2600-2700	2700-2800	Flock was not ready at 147 days, now in condition with fleshing and pelvic fat
154	>2700	>2800	Light stimulation should happen even if pelvic fat is <90%

Field experiences

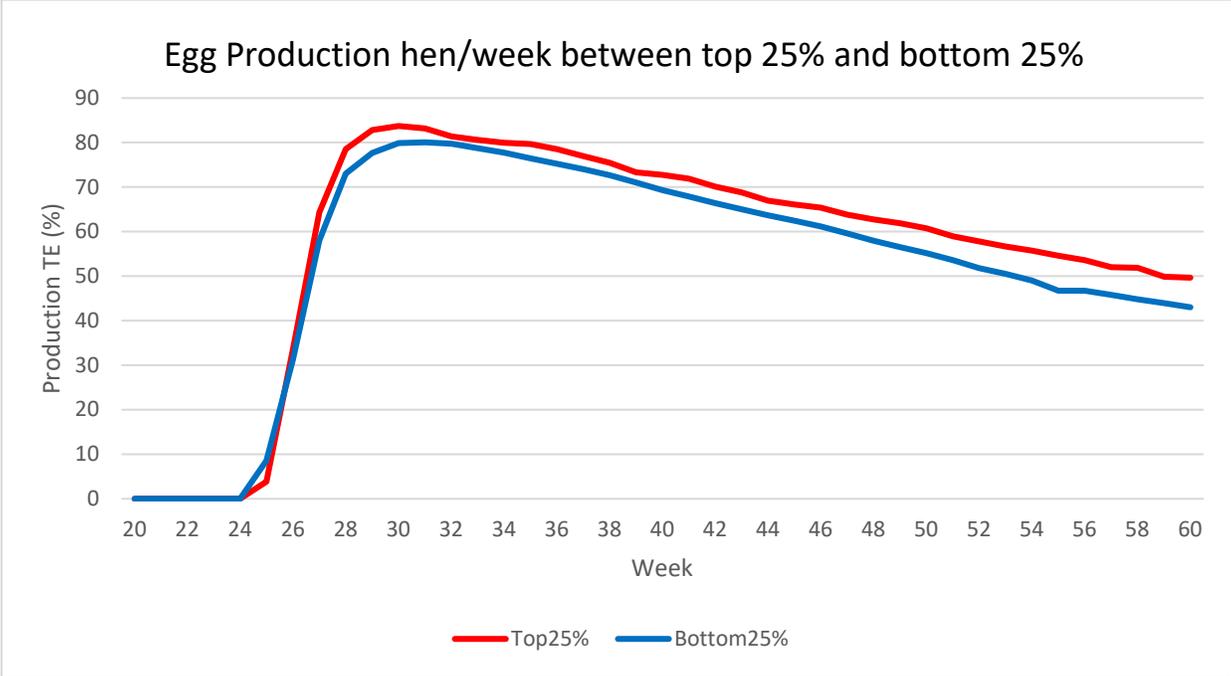
A private company in Europe has analyzed their top and bottom flocks. In total the data consisted out of 1.6 million breeders both top 25% and bottom 25% flocks consistent of approximately 400,000 breeders. All birds were reared on a spin feeder with nipple drinker. Grading was done at 4 weeks in all flocks. One of the key factors was the uniformity differences during rearing (Figure 3). The uniformity increased in all flocks, but the top 25% flocks had better uniformity. At 6 weeks the top 25% flocks had about 10% higher uniformity and at 12 weeks uniformity was still 4% higher than the bottom 25% flocks.

Figure 3: Uniformity differences between the top 25% and bottom 25% flocks



In this study, higher uniformity resulted in a faster increase towards peak production and a higher peak. The production persistency was also more consistent for the top 25% flocks. Furthermore, at 60 weeks, there was a difference of 13.2 total eggs between the groups (Figure 4).

Figure 4: Hen/week egg production between Top 25% and Bottom 25% flocks.



Summary

The correct feed management and in particular feed distribution are central to improving uniformity. Grading is an excellent tool to improve uniformity. Aim to achieve uniformity at a young age as uniformity is a challenging factor to control as the birds age. High flock uniformity is a key factor for achieving high flock reproductive performance.



A.



B.

Photo Source: Cobb-Vantress

Caption: Figure 2. Pelvic fat on females. Panel A, poor amount of pelvic fat, Panel B appropriate amount of pelvic fat.