Controlling Egg size

Egg size is an important factor that determines the profitability of egg production. In some markets a premium is paid for a larger egg size, while other markets require a smaller egg size.

In this technical bulletin you will find advice on how to reduce and increase egg size.

Factors that influence egg size

Breeding
Since egg size is highly heritable, genetic selection is an important factor in determining the egg size. The genetical background is fixed, but with management techniques we can influence the egg weight in a certain way.

Bodyweight in rearing period
Although bodyweight is affected by many management factors, including lighting schedule and beak trimming, nutrition is a very important factor. The growth of the pullet is most responsive to higher levels of protein and energy during the first phase of the growing period. The right feed formula is very important in obtaining a good bodyweight at 5-7 weeks and a good production and in the laying period (see also our technical bulletin Bodyweight at 5 weeks).

Also uniformity at 16 weeks is very important. When flocks have a bad uniformity often light stimulation is delayed and therefore some birds will produce larger eggs.

Very important is that the control of egg size must begin before the egg reaches the upper limit that is desired.

Nutrition
The egg size during the first phase of the production period is partly influenced by nutrition. Crude protein, (essential amino acids such as methionine) and fat (linolenic acid) are important nutritional factors in egg size development.

This is the reason that in phase feeding programs crude protein, amino acids and a relatively high energy level is used in the formula's during the first phase of production, and show a reduction when egg size has reached the desirable level.

A mid-night snack can increase egg size, through higher feed intake.

Temperature
It is difficult to maintain egg size during high temperatures. As environmental temperature rises above 27 degrees, egg size begins to drop.

Heat stress reduces total egg production and the shell quality gets worse.

Lighting programs
Intermediating light schedules have an increasing effect on egg size. For example short repeating lighting programs have an increasing effect on egg weight, also the reading light schedule has the similar effect on egg weight.

When a Cornell lighting schedule is started at a young age (18 weeks) the birds will become earlier mature, which results in a lower egg size.

Egg size too big

Main Reason	Sub Reason
Overfeeding	Feed amount too high
	Energy content too high
	Linolic acid content too high
	Amino acids (methionine) too high
	Protein content too high
	House temperature too low
Bodyweight too high	Too high bodyweight at end of rearing period and begin of laying period
	Inadequate feed programme
Onset of lay too late	Bodyweight too low at end of the rearing period
	Light stimulation at end of rearing period and begin of laying period too late
	Season influences (especially in open houses)
Poor uniformity	Bad rearing conditions
	Inadequate selection
	Bad feed distribution system in rearing period
House temperature	Low house temperature will increase feed intake and as a result a bigger size egg

Rationing of feed can be done to control egg size, however when done too drastically it can also have an effect on production.

Egg size too small

Main Reason	Sub Reason
Underfeeding	Feed amount too low, not enough feeding times, no midnight snack
	Energy content too low
	Linolic acid content too low
	Amino acids (methionine) too low
	Protein content too low
	House temperature too high
Bodyweight too low	Inadequate feed programme in rearing period and begin of laying period
	Poor weight control
Onset of lay too soon	Too much direct daylight in the houses at rearing period and begin of laying period
	Light stimulation at end of rearing period and begin of laying period too soon
	Bodyweight development at end of rearing period is going too fast
Poor uniformity	Poor rearing conditions
	Inadequate feed distribution or feed programme
Limited water intake	Too strong restriction → lower feed → intake lower egg weight
	Bad water supply system
Temperature too high	Season, climate conditions
	Overcrowding
	Poor ventilation