

Peak of production is a crucial period for maximising overall flock performance

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For all kind of laying hens, parent stocks, grandparent stocks or commercial laying hens, peak of production is a crucial period and will affect the overall technical result. Management mistakes, poor bird condition or a lack of technical follow up can lead to poor technical performance and lower income and this will never be recovered even if the second part of the lay is excellent.

If there is one period, where investment is required, it is during peak of production or between 18-35 weeks of age.

Different kinds of issues could occur and the most common one is a too low feed consumption or too low feed concentration used at peak of production. This leads to a lack of nutrient intake (protein, amino acids, etc) and/or a lack of energy intake.

Consequences on production are a laying rate with a 'V' profile (peak/drop/recover) usually characteristic of low amino acids intake, or a slow laying rate decrease associated with low body weight. These issues could be prevented by the respect of some simple rules:

1 Adjust amino acid concentration according to the feed consumption observed.

The first target is to satisfy the amino acid requirement for egg production and growth. Until 35 weeks of age, a bird's growth continues parallel to the egg production start.

Daily feed consumption at the early stage is low (close to 85g) and needs to increase quickly to over 110g. Recommended amino

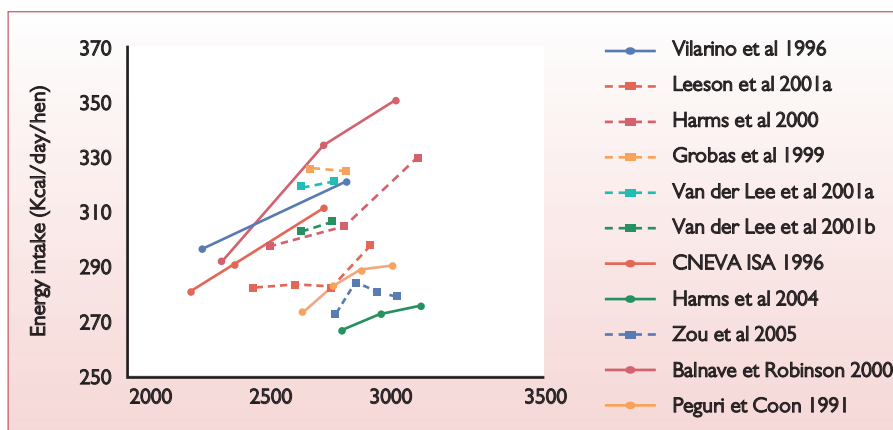


Fig. 1. Effect of metabolisable energy on daily energy intake (Galea 2010 unpublished).

acid requirements are presented in Table 1. Requirements need to take account of several parameters but the main one is the daily egg mass output.

Table 1 presents the requirement for an egg mass output of 59.5g. In some contexts, late birds and/or high fat feeds for example, egg mass output could reach 62g/day leading to a higher requirement.

This requirement could be easily estimated by multiplying daily egg mass by the requirement per gram of eggs given.

1 Take security margin according to the flock evenness.

A security margin must be taken on nutrient concentration to take account of factors like flock evenness. When a flock is not even, diets must be designed for the weakest bird (meaning the smallest one).

Due to their low bodyweight or low feed

consumption, these birds need a more concentrated diet. If a diet adapted to the average bird is used, the smallest one will never develop properly and will not express their genetic potential due to a sub-optimal diet concentration. We have to keep in mind that we feed a bird population and not a bird alone. Flock evenness is a very important parameter to consider.

1 Weigh your birds.

Too many egg producers think bodyweight is very important during the rearing but if you ask them what the bodyweight of their flock in lay is, only a few of them will be able to answer you. Bodyweight is very important to follow until 35 weeks of age. Laying hens are still finishing their growth when they start to lay. If feed intake is not enough during this period, bodyweight will be affected, even if you provide a good feed, rich enough in amino acids, to fit birds' requirement.

During this stage bird energy requirement is high and feed intake low. A lack of energy intake first affects bodyweight and will be the growth limiting factor. Bodyweight is important because it provides robustness to the layers. Small birds will be able to lay and to have good performances, but if anything happens (disease, management issues, bad feed quality, etc), production will drop quickly. However, heavier birds will mobilise their reserves and will 'absorb' the problem without a production drop.

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Table 1. Recommendations for amino acids expressed in total or digestible and ideal proteins established for a production of 59.5g egg mass per day based on European table 2002 (ISA 2008).

Limiting amino acids	Ideal protein	Requirements in mg per g Dig. AA	Total AA	Daily requirements Dig. AA	Total AA
Lysine	100	13.34	15.0	795	895
Methionine	53	7.1	7.56	420	450
Methionine + cystine	82	10.9	12.1	650	720
Tryptophan	22.2	3.00	3.50	178	208
Isoleucine	90	12.2	13.35	725	795
Valine	96	13.0	14.35	775	855
Threonine	70	9.4	11.0	560	655

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1 Promote energy consumption.

If amino acid intake is enough to fit bird requirements, hen bodyweight reflects bird energy balance. In case of high energy requirement (low temperature, poor feathering, high production), a big part of the energy intake will be used for maintenance and production, leading to very little energy left for growth. Several factors will help laying hens increase their energy intake at start of lay.

First of all, even if the feed concentration is excellent, performance will be bad if birds will not eat it. Feed presentation is the most important factor involved in feed palatability. Birds hate fine particles.

Many trials have shown fine grit leads to low feed consumption. Fine feed particles below 0.5mm must not exceed 15%. At the opposite extreme, too big a particle size will promote big particle consumption but lead to particle sorting. Flock evenness will then be affected. We advise not to exceed 10% of particles over 3.2mm.

Raw materials used and grinding parameters

are the two key points to play with to control feed grit. Dusty raw materials must be avoided if feed is too fine. Wire screen size and grinder speed must be adjusted by feed plants during the process to obtain good grit. Oil addition of 1-2% will help to stick fine particles and improve feed palatability. A good feed presentation is the first parameter to control to promote energy intake, feed energy concentration is the second one.

Many studies have shown laying hens regulating well their feed consumption according to the energy feed concentration. When feed energy concentration is increased, feed consumption decreases. But this regulation is not perfect and we observed higher energy intake with high level of energy, when we expressed it in kcal/day/hen (Fig. 1). That means, a higher energy diet will promote energy intake.

Energy intake will be promoted by applying good feeding techniques. Some feed consumption issues at the start of lay are linked with bad feed distribution management. The main objective in promoting feed consumption is to avoid fine particle accu-

Particle size	
< 0.5mm	> 3.2mm
15% maximum	10% maximum

Table 2. ISA recommendation for optimal layer mash feed particle size.

mulation.

As we have seen, birds are grain eaters and prefer large particles instead of fine ones. A common mistake is to increase the number of feed distributions when faced with too low a consumption.

Too many feed distributions will promote sorting and lead to fine particle accumulation. It is crucial to have the feed trough empty on a daily basis. By introducing an empty feed trough once per day, birds are obliged to eat the smallest particles.

Birds' natural behaviour is to eat in the morning and before the night. To secure eggshell quality, the crop must be filled before the night. 60% of the feed has to be distributed in the afternoon. Afternoon feed distribution must always be the same, unlike morning feed distribution which has to be adjusted. If the feeder is never emptied, decrease the amount distributed in the morning; if the opposite is true increase the morning feed quantity. This technique is more efficient if the pullet has been previously trained during the rearing phase.

To conclude, peak of production success is linked to the ability of egg producers to use feed rich enough in amino acids and energy to fit the birds' requirement.

Technical parameter follow up, like daily egg mass output and feed consumption, are essential to adjust feed concentration without neglecting the hen's bodyweight.

Feed presentation and distribution technique play an important role in achieving good early lay results. Compliance with these rules will allow good bodyweight development and hence good results. ■

Fig. 2. Feed distribution strategy to promote feed consumption.

