



■ Feeding management in production

H&N TECHNICAL TIPS

FEEDING MANAGEMENT IN PRODUCTION

Selective feed intake

The genetic potential of the H&N layers is remarkable, and thanks to constant investments in our breeding program, will keep on improving. To make the most of this genetic potential, we need to ensure that all factors related to management, feed, the environment and overall health status is always operating at the optimum level.



Technical TIP

The layer hens have a selective feed intake

Meaning they will only eat all the nutrients of the feed if the structure is attractive.

It is well known that feed plays a major role in achieving this goal, while also having a great impact on the production cost. The feed will often have a different composition in terms of nutrients and raw materials, often influenced by the raw ingredients available locally as well as the target feed intake and egg mass production that the diet is designed for.

We must also remember that the layer hens have a selective feed intake, meaning she will only eat all the nutrients of the feed if the structure is attractive. Therefore, the feed mill has an important job to do and a big challenge if a balanced nutrient intake is to be guaranteed.

The feed mill receives raw materials all with a different size and density so they need to be well processed, mixed and combined in a homogeneous structure so that layer hens will eat the full nutrient package and cannot selectively eat. A homogeneous structure of feed is the path to provide the nutrients for the best performance. Unfortunately, under commercial conditions it is not always possible to produce the ideal feed structure.



Selective feed intake is an innate behaviour, so to help us overcome these challenges, we would like to highlight some of the farm management techniques that can be applied for achieving the optimum feed intake with the correct nutrient profile that the layer hen needs for a performance according to its genetic potential.

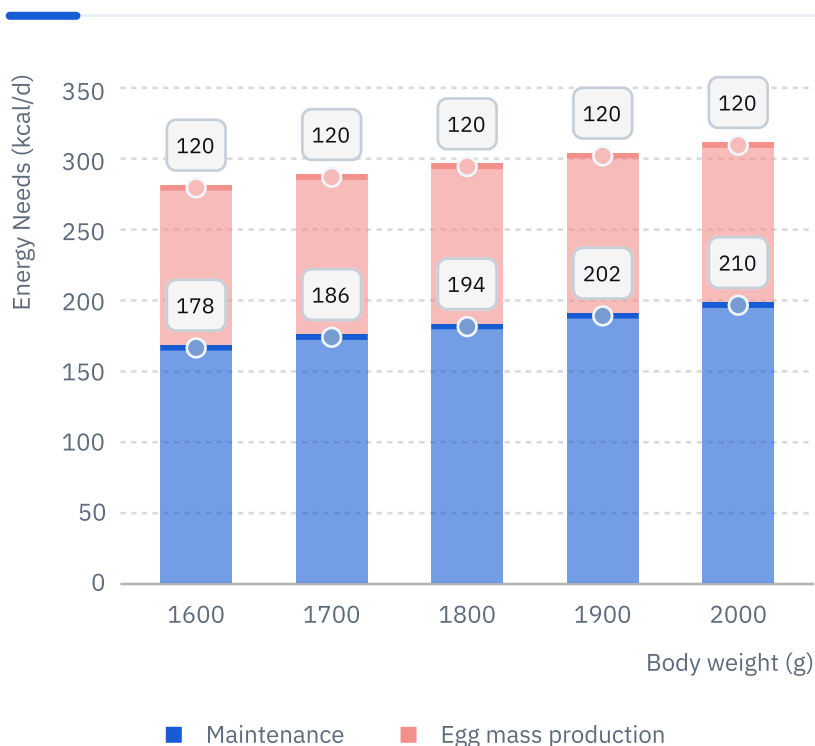
In this article the different aspects related to feed management during production will be covered. It is assumed that a good rearing has been done and the flock has a good uniformity and a good body weight development. Furthermore, it is taken for granted that an adequate feed intake training has been applied, especially from week 10-11 onwards, that guarantees a good development of the bird's digestive tract.

Eating behaviour

The main driver of feed intake in layer hens is to supply and match their energy needs; the energy needs are determined by the hen's requirements for maintenance, growth and egg mass production. The main driver for the daily energy need is the body weight, therefore it is important to permanently know the average body weight and uniformity of each flock and understand how it impacts the behaviour of the birds within the flock.



Graph 1. Effect of body weight on daily energy need maintaining a constant egg mass production.



As the bird grows, the daily energy needs will increase (see [Graphic 1](#)). This will impact the feed intake of each bird.

Feed formulation is normally calculated for an average bird, but those above average will be the ones struggling to get what they need.

The larger birds, normally with a higher hierarchy within the flock, will have the opportunity of selecting and eating what they want (mainly big particles high in energy) and the less dominant hens generally get what is left (small particles high in amino acids and vitamins).

Consequently, if the feed structure is not homogeneous, both groups will then get an unbalanced intake of nutrients. To minimise this problem maintaining a good flock uniformity combined with adequate feeding space per bird is essential. (This will be discussed later in further detail).

Technical TIP

To avoid the challenge caused by temperatures out of the layer comfort zone, it is recommended to invest in a good ventilation/ heating system and ensure the building has efficient insulation.

Another factor that can impact feed intake behaviour is the temperature of the barn. The layer hen’s energy intake increases as the temperature drops and reduces as the temperature increases. At temperatures above 27° C, the overall performance of the hen can be compromised due to the reduced energy intake alongside the additional energy required by the activation of the response mechanisms such as panting that is used to expel excess heat.



At temperatures below 20° C feed intake will increase and there will be a higher requirement to utilise energy to maintain body temperature. While this will affect feed efficiency, performance is often not affected.

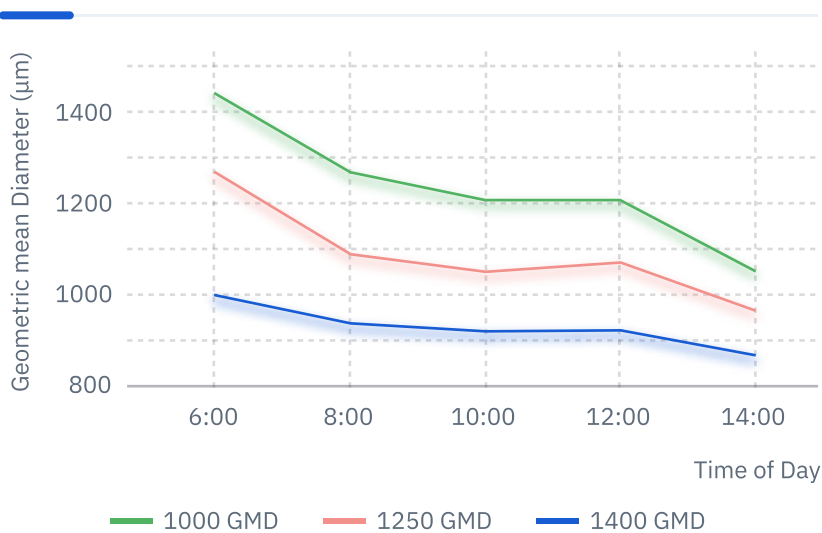


To avoid the challenge caused by temperatures out of the layer comfort zone, it is recommended to invest in a good ventilation/ heating system and ensure the building has efficient insulation.



Looking further into selective feed intake, research shows that the limiting factor for the selection of what they eat is the particle size and not one specific nutrient.

Graph 2. Evolution of the geometric mean of the feed with time (Adapted from Herrera et al., 2018)



Hens will naturally select the larger particles over the smaller nutrients you generally find at the bottom of the feeders. If we don’t control this behaviour then the average geometric mean of the feed will be reduced. (Graphic 2, Adapted from Herrera et al., 2018).

Therefore, we must ensure that the fine particles have been eaten before we deliver another feed distribution to prevent further selection of the largest particles. An imbalanced distribution will allow the birds to meet their intake requirement but fail to supply a balanced nutrient profile.

Furthermore, we need to consider that the feed intake will increase based on the needs of the layer hen during the day.

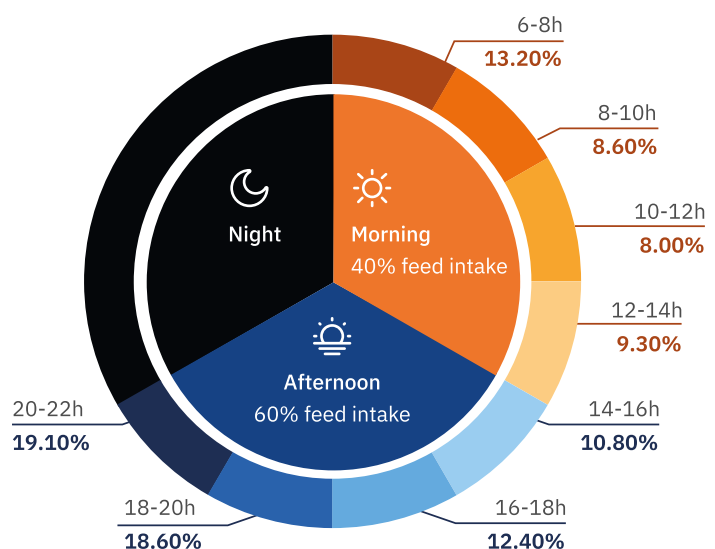
In production, the layer hen will increase the feed intake in the afternoon as the requirements for egg production increase.

Generally, 60-70% of the daily feed intake is taken in the afternoon (Graphic 3).

Feed deliveries should be adjusted to meet this demand. Pay especial attention to free-range production since the birds might stay outside for long periods of time.

They should get a full meal before they go to the range.

Graph 3. Eating behaviour of the birds (adapted from Keshavarz, 1998)



Overcoming feeding challenges

In the next bullet points, we would like to provide some practical recommendations can help achieve the balance between feed and nutrient intake on the farm.

Picture 1. An example of an empty feeder chain (first picture) taken in an area of high activity and an example of a low level of feed (second picture) in a normal area.



Empty feeder vs. Low level of feed

This low feed level should be achieved once a day

01

Correct feed delivery

From the age of 5 weeks onwards it is advised to train the animals to empty the feeders once a day (Picture 1).

By doing this, the birds are encouraged to eat the finer particles of the feed. During this training period, it is **IMPORTANT** to have somebody present to monitor the behaviour of the animals, especially in cage-free systems to ensure the feed is not restricted and undue stress is placed on the flock.

Once the feeders are empty, the next feed delivery should be offered.

This should be done by block feeding. Block feeding is simply running two feeds in quick succession.

The aim is to offer all birds a complete feed with a balanced nutrient content.

The empty trough will have made the birds hungry; the dominant birds will be the first ones to the feeders where they will eat and become satiated. When the second feed runs the less dominant birds will find it easier to access the feeders and allow them to get a complete feed and not the leftovers of the dominant birds.

It is highly advisable to continue this practice of feeding to an empty trough in the production house after transfer. To prevent any impact on egg production cycles it is advisable to implement the empty trough method around noon. Furthermore, at this time the farm staff will be working around and can react in case of unexpected events. Also bear in mind that 40% of the feed will be consumed in the morning and 60% in the afternoon. So, plan your feeding program accordingly.

Technical TIP

Make sure that there is always feed available at the latter part of the day. This is to ensure there is enough feed available during egg production in the afternoon period. The last feed should be run around two hours before lights out.

2h

02

Training feed intake capacity during week 10 to 17

During this period, we need to promote a good feed intake to aid the development of the digestive organs as well as to promote feed intake capacity prior to the beginning of the production cycle.

The limiting factor for feed intake is the **gut size**, stimulating, and therefore increasing the size of the crop, proventriculum, gizzard and intestine during this period will allow the bird to have a larger feed storage capacity. This is essential to allow the hens to ingest and digest a complete balanced feed.

A mature hen eats 100-120 grams depending on several factors such as breed, feed nutrient density and production environment. A hen that has been trained in rear for a larger intake capacity will not only transition easier into the production cycle but will also be in a better position to adapt to the challenges in the egg production phase.

Technical TIP

Block feeding is simply running two feeds in quick succession. The aim is to offer all birds a complete feed with a balanced nutrient content after managing the feeding times for the birds empty the feeders.

03

Uniformity of the flock

Good uniformity within the flock will reduce the competition among the layer hens. This will allow all the birds the opportunity to eat a fully balanced meal therefore improving the nutrient balance within the flock.

Furthermore, the actual requirements of the individual hens within the flock will be more closely aligned to the calculated average flock nutrient needs.

Technical TIP

A mature hen eats 100-120 grams depending on several factors such as breed, feed nutrient density and production environment.

04

Equal delivery of the feed

This has a direct impact on the uniformity of the flock.

Feeder space:

In cage production, this is a limiting factor for achieving good flock uniformity in both rearing and production.

It will also limit dramatically the growth of the pullets (see [Table 1](#)).

Table 1. Feeder space recommendation

	Feeder Space
0-3 weeks	2.5 cm/bird
4-16 weeks	5 cm/bird
>17 weeks	≥10 cm

05

Fast delivery of the feed



This is an important factor especially for cage free production.



Picture 2. Example of feed collected at the beginning (left) and at the end (right) of the feeding line

In this kind of production system, birds are free to choose where and often what to eat.

It is key to deliver the feed as fast as possible so that the feeders along the barn are quickly filled and the birds don't have the option of selection during the feed delivery.

In practice this is not so easy to achieve, and it can often be seen how a group of birds are congregated at the beginning of the feeders trying to select the big particles while at the end of the feeding line there is only fine particles available for the hens in this area (see [Picture 2](#)), this problem is exacerbated when the feed delivery system runs slowly.

Technical TIP

It is key to deliver the feed as fast as possible so that the feeders along the barn are quickly filled and the birds don't have the option of selection during the feed delivery

Before building a barn especially in alternative systems it is important to pay special attention to the feeding system:

Feeding chain is preferred to feeding pans: feed chains tend to help maintain better uniformity within the flock and hold the structure of the feed better than other systems during the feed delivery.

Use fast running feed chains >18 m/min: with a fast running chain, the layer hens cannot selectively eat during the running times.

Consider the possibility of **controlling chains separately at different levels:** if the distribution of the layer hens in an aviary isn't homogenous, we might need to feed more often at certain levels than others.

Ensure enough supply and/or storage capacity: using the block feeding technique requires you to have enough feed stock or feed supply capacity in the barn (see [Picture 3](#)).



Picture 3. Example of a good dimensioned feed delivery

06

Monitor water consumption

Clean water of good quality and adequate temperature must always be available. Birds must have access to a sufficient number of evenly distributed drinkers. Extra attention is necessary in hot climates.

The water system must be checked and cleaned regularly to ensure functionality. Water consumption must be closely monitored as birds that are not drinking appropriately will often have a lower feed intake which can impact on body development and production.

Present and future challenges

- Currently, **beak treatment** is still allowed in many countries, however some north European countries have already banned this practice while others have chosen not to implement it themselves.
- Hens with full beaks have more difficulties eating fine particles; therefore, the practices described above can have a reduced effect and so the structure of the feed produced in the feed mill is key.
- Feed with very coarse structure or the use of pellets or crumbles could help under these circumstances, always with an additional system to supply coarse calcium.

In summary

- The layer hens eat to satisfy energy needs and they eat depending on body weight, temperature in the barn and particle size.
- The feeding practices help the layer hen to have a complete balanced nutrient intake.
- The timings of the delivery of the feed can help teach the layer hens to eat the fine particles that they don't find attractive and otherwise would avoid.
- Feed intake capacity allows the layer hen to get more feed per each feeding time and overcome the feed intake challenge at the start of production.
- High uniformity flocks will have less competition for eating.
- Make sure that not only is the feed mill producing a good homogenous feed structure but also and no less important that the feed in your facility is delivered effectively and efficiently.



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