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ENG

# FEED INTAKE IN CAGE FREE PRODUCTION



Cage free production is fast becoming common as a management system for our hens; however, they bring with them their own set of challenges. With this in mind, a new approach in management practices and nutrition needs to be adopted to help us achieve the same excellent genetic potential we used to witness in our cage systems.



**Accessibility and movement behaviour are additional elements to consider in these systems and can affect feed intake efficacy. This can subsequently have a negative impact on profitability and recovery periods of our flocks in the face of challenges.**



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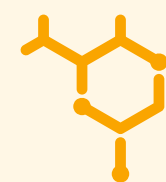
## NUTRITION

### Rearing phase

Regardless of the system employed, we can agree that this is the most important period of a hen's life, and in cage free systems, its influence is even more pronounced.



Assuming that target body weights are the same for both systems, we must consider that **the hens' additional physical activity within cage free systems will naturally increase their nutritional needs.**



An adequate combination of a higher nutrient density, with a preponderant role of amino acid profile, **a higher feed intake and an adequate feeding pattern will have a considerable impact on flock performance.**

**From a nutritional perspective, we can simplify the rearing phase in cage free systems into two main target areas.**

**Body weight development profile & imprinting of foraging behaviour. (Allowing the replication of natural behaviour in relation to food search/ directional foraging and comfort behaviour within the litter area.)**



**As a starting point from a management perspective, it's important to provide early access to good quality litter material.** This not only redirects natural foraging behaviour to a safe area but also promotes the pullets to express comforting behaviours of foraging and dust bathing.

It can also help reduce misdirected feather pecking behaviour later in production (*Blokhuis and Van de Haar, 1989*).



**90% of birds showing pecking behaviour in rearing will repeat it during lay.**

If litter access is restricted through non provision or poor quality (i.e. through caking), pecking behaviour can be redirected into negative flock behaviour.

**To help reduce this risk, close attention should be paid to the feed profile, so any negative or misdirected foraging behaviour is redirected to the feeding system.**







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## NUTRITION

### Feed characteristics during rearing

It is clear that within cage free systems the impact of:

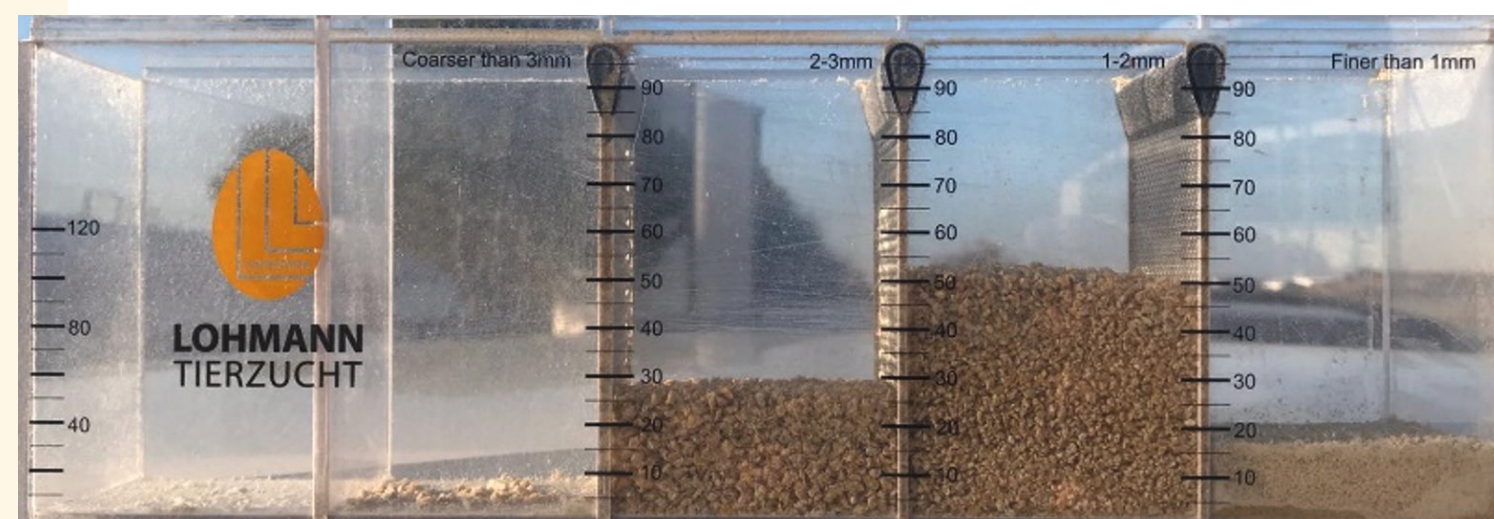
- Feed nutrient composition
- Feed structure and presentation
- Nutritional profiles
- Feed management

has a larger influence than in cage systems.

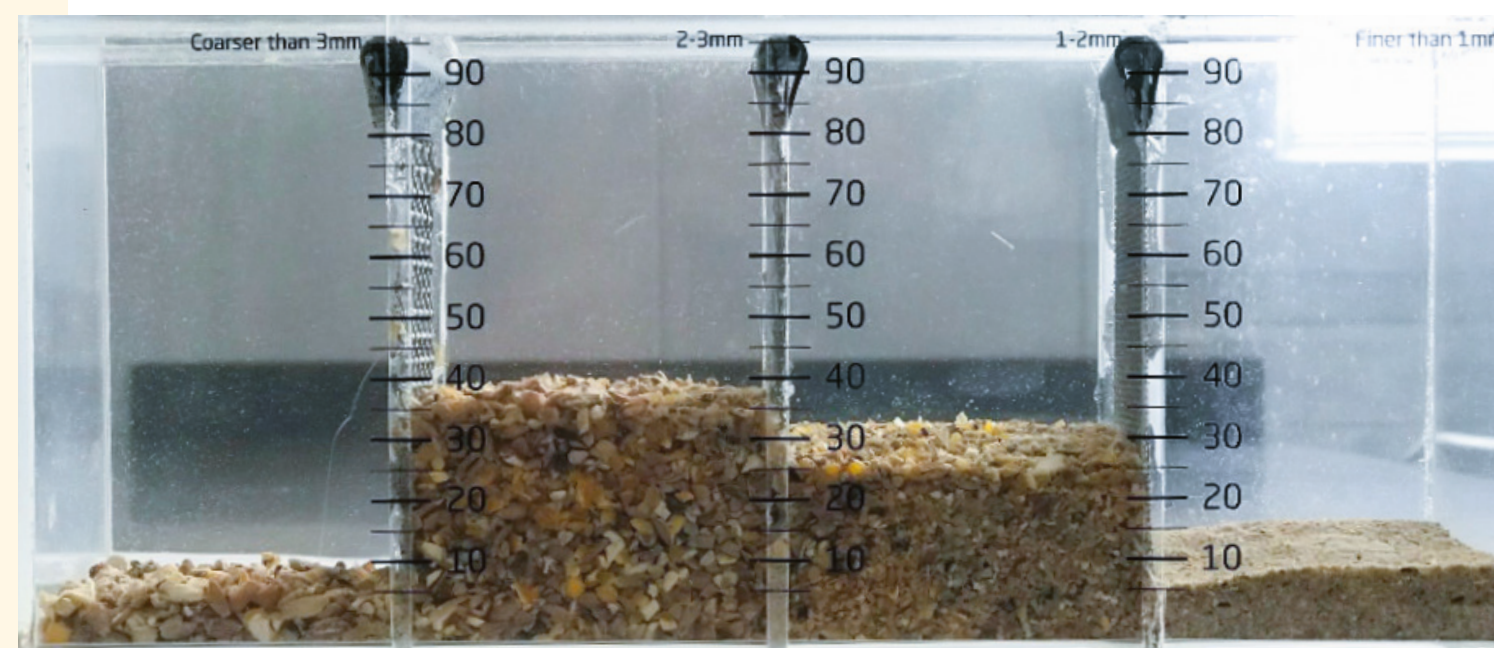
Feed structure, presentation and delivery are important **since increased movement within these systems can allow the hens more chances to selectively feed** (as is their natural behaviour) compared with cage systems.

Therefore, homogeneous particle distribution is a priority (**Pictures 1 and 2**).

▼ **Picture 1.** Feed distribution particle. Rearing. Crumbs.



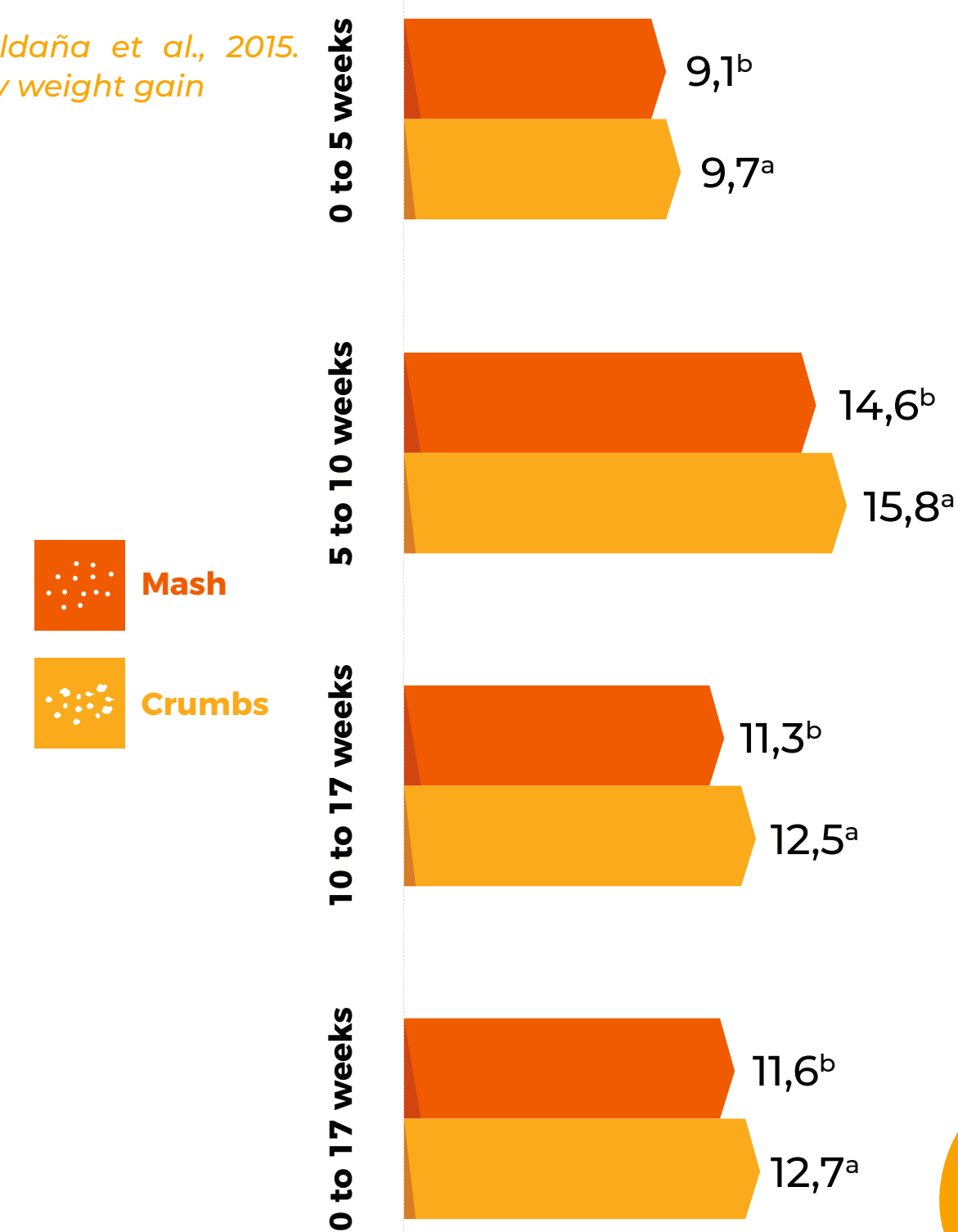
▼ **Picture 2.** Feed distribution particle. Lay. Mash.



Sometimes, when it's not possible to provide mash with adequate particle distribution, **using crumbs during first 5 weeks of age is advisable but only if the content of the fines (particles below 1mm of diameter) is below 15%** (**Graph 1**).

This can help improve the average body weight gain, feed intake and has also been suggested that it can influence uniformity. *Saldaña y col., 2015.*

► **Graph 1.** *Saldaña et al., 2015.*  
Average daily weight gain



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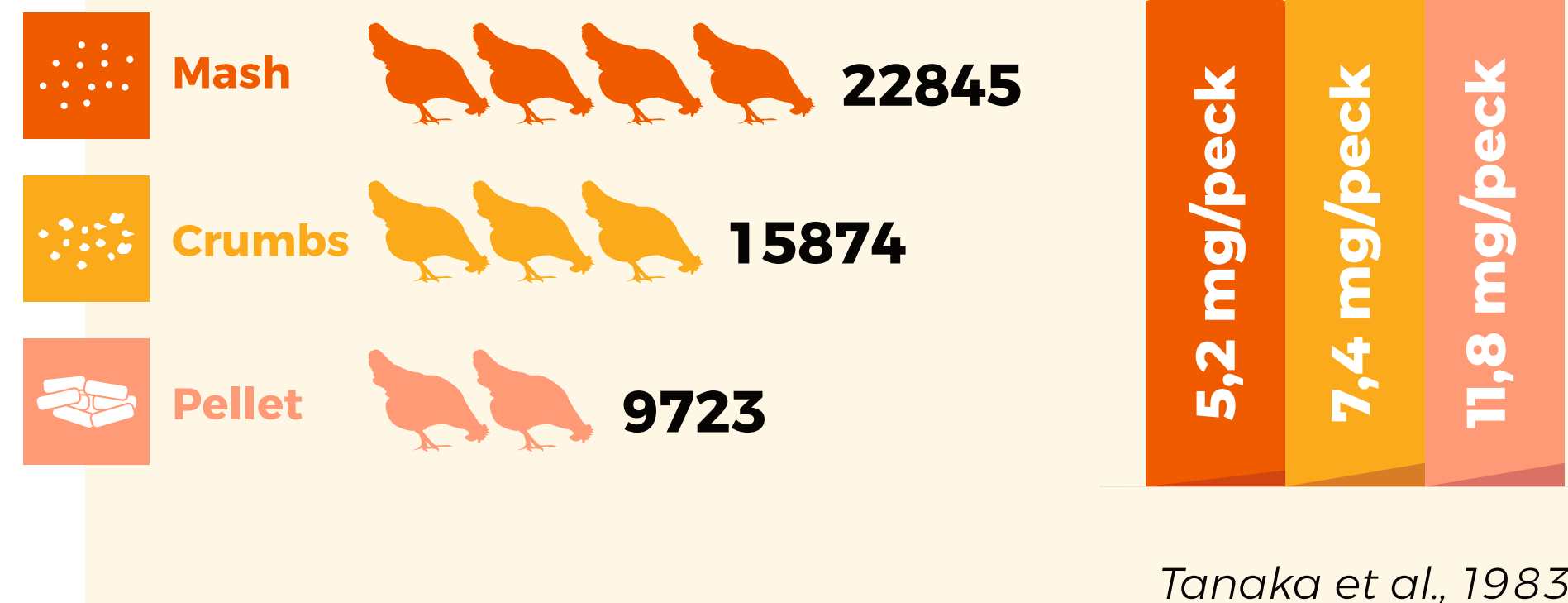
## NUTRITION

**Feed intake plays a major role in cage free systems**, from positively influencing digestive tract development during rearing with respect to volume, digestive capacity, and onset of production.

To promoting their imprinting process and feeding behaviour, **particularly during the first 4 weeks of age** where we are training and directing feed pecking behaviour.

Using mash feed at day old, with adequate feed particle size and moderate energy levels can help keep the interest of chicks confined to the feeding area, as they'll spend more time pecking in the troughs unlike when using pellet or crumb feed (**Graph 2**).

► **Graph 2.** Time spent eating and volume of each peck motion with different feed structures.



In conjunction with mash feed, **using a relatively low energy level from week 10 until start of lay (2700kcal/kg/11.3Kj/kg)** and moderate levels in production (2650-2750kcal/kg/ 11.1-11.5Kj/kg) can help increase the time spent feeding which will, in turn enhance feed intake capacity.

**Reducing the energy level of the feed (within reason), will encourage the hens to eat more to compensate their requirements for maintenance and movement.**

**It's important to have in mind that from week 9-10, hens can regulate their intake depending on the energy level of the diet.**

Working with a moderate energy level from this point will also encourage the birds to spend more time eating (less g of feed/minute) ultimately fulfilling, at least partially, their foraging needs (**Graph 3**).

▼ **Graph 3.** Feed intake evolution with energy dilution in rearing.

Energy dilution	Daily intake, g/bird
Control	55,4 <sup>c</sup>
10% dilution	62,4 <sup>ab</sup>
15% dilution	66,1 <sup>a</sup>

Van Krimpen, 2008



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### Start of production

It is important to understand that the rearing period actually ends when the average bodyweight gain achieves a plateau around week 30 (less than 3g per week).

This period also combines with the onset of lay, so it's crucial to continue focusing our attention on feed intakes in this phase, to help support the start of production while allowing the hen to maintain its body weight growth.



Monitoring body weight during this period will be critical.

Unfortunately, there are some flocks that, even though they achieve target body weight at transfer, don't have enough feed intake capacity to support the continued growth and the onset of lay. **This has the potential to compromise productivity as they often lose bodyweight at the expense of production.**

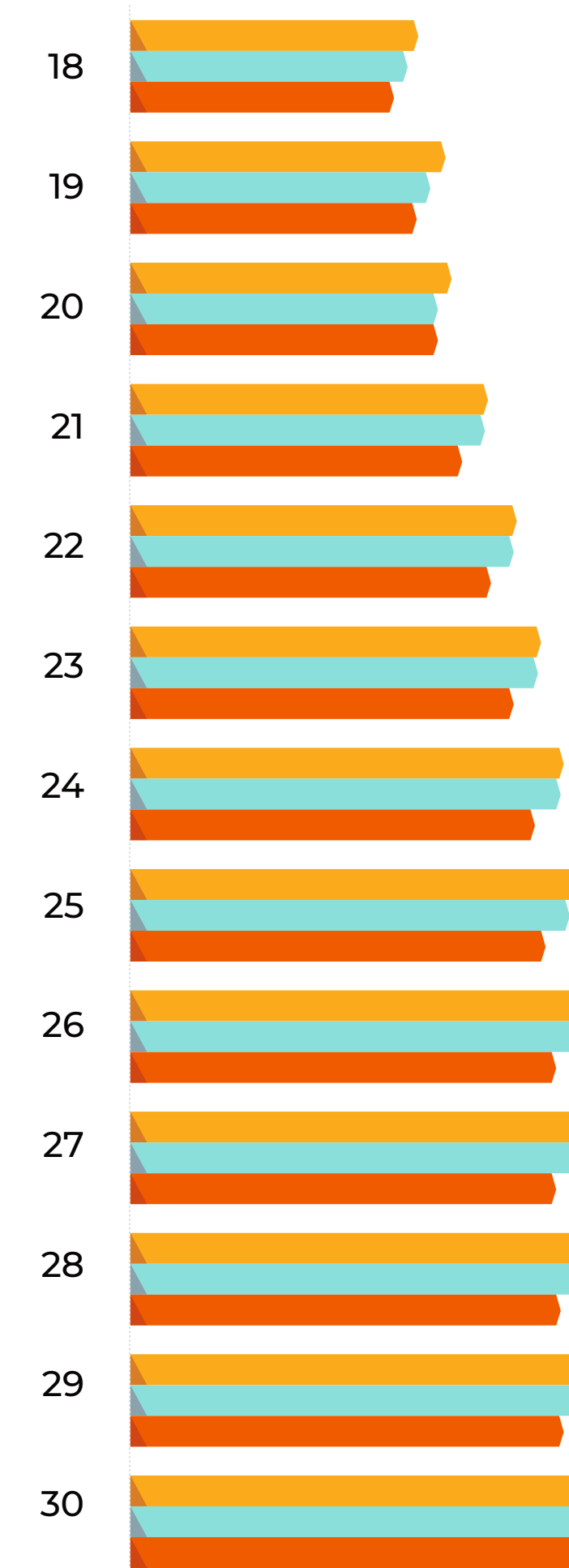


Let's analyse, from a practical point of view, what's happening with energy needs during this period (**Graph 4**).

In the picture above, we can observe how a bird with **adequate feed intake capacity (blue bar)** is able to relatively maintain its **energy intake (kcal/hen)** according to its **needs (orange bar)**.

On the contrary, those hens with **low feed intake capacity (red bar)** will not be able to intake enough feed to satisfy their energy needs and, **despite the fact production will start as expected, it will often be at the expense of the body reserves which could seriously compromise the flock's continuous performance.**

▼ **Graph 4.** Practical case: daily metabolizable intake evolution kcal/hen/day



Energy needed, kcal/bird/d



kcal/bird/d  
(adequate feed intake capacity)



kcal/bird/d  
(low feed intake capacity)

Additionally, if we are also providing feed with a higher energy level compared with the rearing phase, feed intake can also decrease, thus worsening the situation.

**It is always important to know the energy level of a reared flock (developer diet) to allow you to adapt the feed specifications at the beginning of production, accordingly, allowing you to avoid sudden changes that could compromise the onset of lay.**



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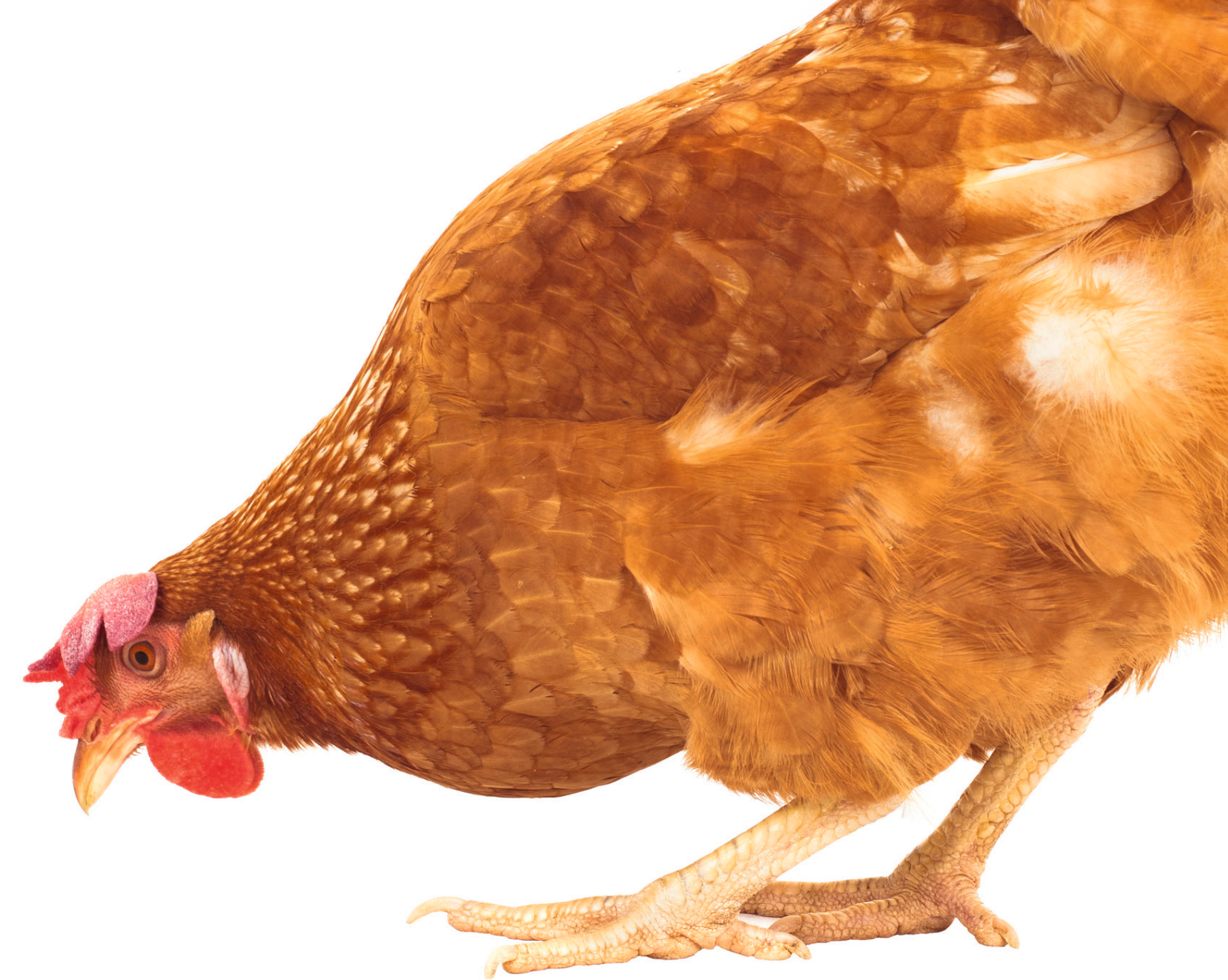


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### Summary

- **Feed foraging behaviour begins from day one**, so what we allow here can have positive effects from the perspective of feed intake & foraging behaviour but remember that flocks can also be subjected to negative effects if we fail to meet their behavioral needs.
- **We achieve our desired objectives by avoiding diets with an excessive level of energy** and increasing levels of insoluble crude fibre while maintaining a minimum of 4.5% of crude fibre content during lay (12% NDF).
- **Feed presentation** (see feed presentation article in toolbox) plays a critical role in cage free systems to help avoid particle selection alongside malleable feed management.
- **It's paramount to monitor during the rearing period parameters such as body weight**, (average body weight gain), daily feed intake and cumulated feed intake: an increase of 4-5% average feed intake is recommended when comparing to cage systems at 17 weeks.
- **During rearing, we should carefully monitor parameters such as body weight growth rates, as well as daily and cumulative feed intakes.**



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