POULTRY NUTRITION

Calcium and phosphorus for laying hens

How much calcium and phosphorus laying hens need, why limestone particle size matters, and how DCP and limestone support strong eggshells.

By FeedSport Nutrition Team · Published 6 October 2026 · Updated 10 October 2026 · 3 min read

KEY POINTS

- A laying hen needs roughly 4 g of calcium a day, so layer feed usually contains about 3.5–4.2% calcium.
- Feed a good share of the limestone as coarse particles (about 2–4 mm) so calcium is available overnight, when the shell forms.
- Phosphorus needs fall as hens age. Too much phosphorus late in lay can weaken shells.
- Do not feed layer diets to pullets before they start laying.

Every eggshell is almost pure calcium carbonate. A hen in full lay deposits around 2 grams of calcium in shell every day, which is a large share of all the calcium in her body. Getting calcium and phosphorus right is the single biggest nutritional lever for shell quality.

How much calcium do layers need?

A hen in lay needs roughly 4 grams of calcium a day. How that translates to the diet depends on how much she eats:

Daily feed intake	Approximate dietary calcium for ~4 g/day
100 g	about 4.0%
110 g	about 3.6%
120 g	about 3.3%

Calcium needs rise as the flock ages, because older hens lay larger eggs and absorb calcium less efficiently. Many layer programmes raise calcium in steps through the laying cycle.

Why limestone particle size matters

Most of the shell is formed at night, when the hen is not eating. If all her calcium comes as fine powder, it passes through quickly and she draws on her bones instead.

Coarse limestone particles, about 2–4 mm, stay in the gizzard longer and release calcium slowly through the night. A common approach is to supply about half to two-thirds of the limestone as coarse grit and the rest as fine powder. We supply feed limestone in both fine and coarse grades.

Feeding more of the daily ration in the afternoon also helps, because it puts calcium in the gut when shell formation begins.

Phosphorus: needed, but not too much

Phosphorus is essential for bone and for the hen's ability to mobilise calcium. Most of the phosphorus in grains and oilseed meals is bound as phytate and poorly available, so layer diets rely on a mineral source such as dicalcium phosphate (DCP), which supplies both phosphorus and calcium.

Formulate on available or digestible phosphorus, not total phosphorus. Typical levels are higher at the start of lay and lower later. Excess phosphorus in older hens interferes with calcium mobilisation from bone and can make shells thinner.

The pre-lay period

Pullets approaching lay start building calcium reserves in their bones. A pre-lay or pre-layer diet, typically fed from about 2 weeks before the first eggs, has more calcium than grower feed but less than layer feed.

Do not feed full layer diets to young pullets before they start laying. The high calcium is more than they can use and can damage their kidneys.

Vitamin D3

Hens cannot absorb calcium properly without vitamin D3. It is supplied in the vitamin and mineral premix. Use the premix at the full stated inclusion, and store it cool and dry, since vitamin activity declines over time.

When shells are still poor

If calcium, phosphorus and vitamin D3 are right and shells are still weak, look at:

- **Heat stress.** Panting changes blood chemistry and reduces shell quality. Provide cool water and good ventilation.
- **Disease.** Infectious bronchitis and other conditions damage the shell gland.
- **Flock age.** Shell quality naturally declines late in lay.
- **Water quality** and access.

- **Mycotoxins** in grain.

Quick checklist

1. Check calcium per hen per day, not only the percentage in the feed.
2. Supply a good share of limestone as coarse particles.
3. Formulate on available phosphorus and reduce it as the flock ages.
4. Use a pre-lay diet and do not feed layer feed to growing pullets.
5. Confirm the premix supplies vitamin D3 at the right level.

Need a diet checked? Send your ingredients and targets to the FeedSport nutrition team on WhatsApp +263 77 468 4534 or sales@feedsport.co.zw.

Figures in this guide are typical values and general ranges. Confirm targets for your animals, genetics and ingredients, and check batch specifications before formulating.