

# The hen needs grams, not a percentage.

Two Lohmann guides — LSL-Lite and Brown-Classic — read straight from the tables.

## The percentage on the bag is not the requirement

### LSL-Lite, Phase 1 — protein requirement 18.0 g / hen / day

The same daily gram requirement, divided by what she actually eats:

|            |            |            |            |
|------------|------------|------------|------------|
| eats 105 g | eats 110 g | eats 115 g | eats 120 g |
| 17.1%      | 16.4%      | 15.7%      | 15.0%      |

Both numbers are Lohmann's own, printed on one row of the Phase 1 table — the same bird, the same day, 2.1 protein points apart on intake alone.  
Hold the grams constant. The label percentage is only right for one intake.

## Two nutrients, moving in opposite directions

| LSL-LITE       | PHASE 1 | PHASE 2 | PHASE 3 | TREND |
|----------------|---------|---------|---------|-------|
| Protein, g/day | 18.0    | 17.5    | 16.8    | falls |
| Calcium, g/day | 4.10    | 4.40    | 4.50    | rises |

As she ages her egg mass falls, so she needs less protein — but her shell gland tires, so she needs more calcium. Phase feeding is not one dial turned down.  
It is two dials turned against each other. Weeks 19-50, ~50-70, then after 70.

## Same calcium, different protein — and Brown eats more

|                       | INTAKE        | PROTEIN g/day P1/P2/P3 | CALCIUM g/day      |
|-----------------------|---------------|------------------------|--------------------|
| LSL-Lite (white)      | 105-115 g/day | 18.0 / 17.5 / 16.8     | 4.10 / 4.40 / 4.50 |
| Brown-Classic (brown) | 110-120 g/day | 18.5 / 18.0 / 17.0     | 4.10 / 4.40 / 4.50 |

The bigger Brown bird eats more and needs a little more protein per day.  
The calcium requirement is identical for both — 4.10, 4.40, 4.50 g/day.  
Only protein differs by breed; the shell demand does not.

## Calcium is also a matter of timing and particle size

### Limestone — fine / coarse split

|         |         |
|---------|---------|
| Phase 1 | 30 / 70 |
| Phase 2 | 25 / 75 |
| Phase 3 | 15 / 85 |

Coarse fraction rises to 85%. Coarse dissolves slowly, so it is still in the gut overnight when the shell gland is calcifying in the dark.

### The pre-lay bridge

#### 2.0-2.5% calcium

~10 days before lay, max 1 kg / bird  
Bridges developer (low Ca) to layer feed (high Ca) without an appetite crash, and primes medullary bone for the first shells.

### The rule this deck is arguing for

Feed the requirement in grams, not the percentage on the label — because the percentage only holds for one intake, and intake is the number nobody measures per bird. Switch phases on egg mass and shell quality, not on the week of the calendar.

Based on Lohmann LSL-Lite and Brown-Classic Cage Management Guides — Nutrition sections, Tables 8 (limestone), 9 (amino-acid ratios) and 10-12 (Phase 1-3 nutrient levels).

# The requirement is grams. The label is a division.

Lohmann LSL-Lite, Table 10 — Phase 1 nutrient levels by daily feed consumption

### Why the requirement is fixed in grams per day

A hen's daily need for protein and calcium is set by what she is building — egg mass and shell — not by the concentration of her feed. Lohmann prints the requirement first, in grams per hen per day, then shows what percentage that becomes at each intake.

| PHASE 1 REQUIREMENT |            | % IN FEED AT DAILY INTAKE OF: |       |       |       |
|---------------------|------------|-------------------------------|-------|-------|-------|
|                     |            | 105 g                         | 110 g | 115 g | 120 g |
| Protein             | 18.0 g/day | 17.14                         | 16.36 | 15.65 | 15.00 |
| Calcium             | 4.10 g/day | 3.90                          | 3.73  | 3.57  | 3.42  |
| Dig. lysine         | 0.80 g/day | 0.76                          | 0.73  | 0.70  | 0.67  |
| Dig. methionine     | 0.40 g/day | 0.38                          | 0.36  | 0.35  | 0.33  |
| Av. phosphorus      | 0.42 g/day | 0.40                          | 0.38  | 0.37  | 0.35  |

### Read one row across

Protein: the identical 18.0 g/day requirement is 17.1% of the feed at 105 g eaten, but only 15.0% at 120 g. Over two percentage points, from intake alone. If you formulate to a fixed percentage, you feed the wrong amount at every intake except the one you assumed.

### This is why a hot house quietly under-feeds protein

Lohmann's tables assume 20 °C and good plumage. In heat, intake drops — a bird eating 95 g instead of 115 g of the same feed is short on protein and amino acids, and lays a smaller egg, even though the bag never changed. The fix is not a higher percentage for everyone. It is knowing what each house ate.

### What page 1 asked you to hold constant

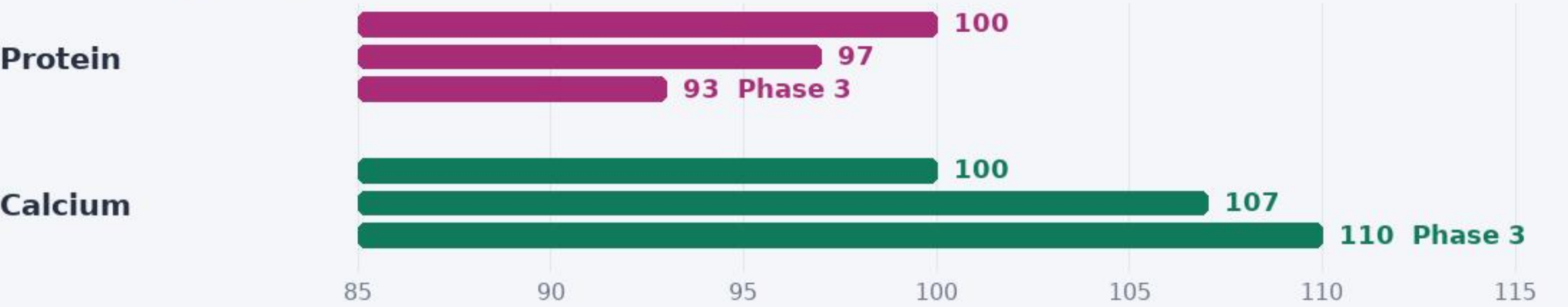
Grams per bird per day, matched to intake — not the number on the label. Everything else on this deck is a consequence of that one idea.

# Protein falls. Calcium rises.

Lohmann LSL-Lite, Tables 10-12 — requirement in g/hen/day across the three phases

| NUTRIENT, g/day | PHASE 1   | PHASE 2   | PHASE 3     | AGE    |
|-----------------|-----------|-----------|-------------|--------|
| Protein         | 18.0      | 17.5      | 16.8        | wk 19+ |
| Calcium         | 4.10      | 4.40      | 4.50        |        |
| Av. phosphorus  | 0.42      | 0.40      | 0.38        |        |
| Dig. lysine     | 0.80      | 0.78      | 0.74        |        |
|                 | wk 19-~50 | wk ~50-70 | after wk 70 |        |

The divergence, indexed to Phase 1 = 100



Same bird. Protein need drops to 93% of peak by Phase 3; calcium climbs to 110%.

## Why protein falls

Egg mass output declines as the flock ages — the Phase 1 threshold is egg mass above 59 g/hen/day, Phase 2 above 55 g. Less egg means less protein and amino acid demand. Feeding peak protein to a post-peak flock buys nothing but cost and excreted nitrogen.

## Why calcium rises

The same egg needs the same ~2 g of shell calcium whether the hen is 30 weeks or 90. But an older hen eats less and absorbs calcium less efficiently, and her eggs are larger, so the shell is spread thinner. To hold shell quality, the diet's calcium must go up even as everything else comes down — 4.10 to 4.50 g/day across the three phases.

## The mistake this page exists to prevent

"Phase feeding" is often run as a single idea — reduce the feed as the flock ages. That halves it. Reduce the protein, yes. But raise the calcium at the same time, or the shells thin exactly when the hen is least able to defend them herself.

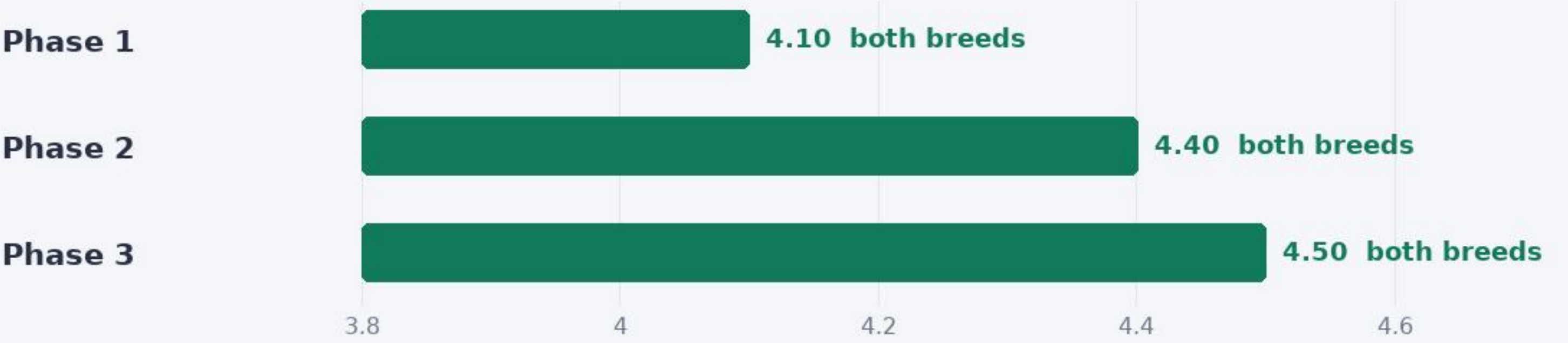
TWO BREEDS

Brown eats more and needs more protein. The shell is the same.

Lohmann LSL-Lite and Brown-Classic — Tables 10-12, requirement in g/hen/day

| PROTEIN REQUIREMENT, g/day | PHASE 1 | PHASE 2 | PHASE 3 |
|----------------------------|---------|---------|---------|
| LSL-Lite                   | 18.0    | 17.5    | 16.8    |
| Brown-Classic              | 18.5    | 18.0    | 17.0    |

Calcium requirement, g/day — identical across both breeds



Brown and LSL are given the same calcium at every phase. The egg's shell demand does not care about feather colour.

What differs, and why

Brown-Classic is the bigger bird and eats 110-120 g/day against LSL's 105-115. It carries slightly more protein per day at every phase (18.5 vs 18.0 in Phase 1) because it lays a heavier egg and maintains more body mass. Feed the two breeds the same protein and the brown flock runs marginally short at peak.

What is the same, and why it matters

Calcium: 4.10 / 4.40 / 4.50 g/day for both. Shell mass per egg is similar, and the age-related rise in calcium need is a shell-gland story, not a breed story. So if you run both breeds on one site, you can share a calcium strategy — but not a protein spec.

The cross-breed lesson

"White eats less" is the useful shorthand. Match the protein and energy to the breed's intake; keep the calcium and limestone strategy common. It is one fewer thing to get wrong on a mixed site.

# Calcium is a clock, not just a dose

Lohmann, Table 8 — continuous supply of fine and coarse limestone by phase

## When the shell is actually built

A hen ovulates in the morning and spends roughly the next 20 hours forming the next egg — the shell is laid down mostly in the second half of that, overnight, in the dark, hours after her last big meal. Calcium eaten in the morning is largely gone by then. If none is left in the gut, she dissolves her own bone to finish the shell.

### LIMESTONE PARTICLE SPLIT

|         | FINE (0-0.5 mm) | COARSE (1.5-3.5 mm) |
|---------|-----------------|---------------------|
| Phase 1 | 30 %            | 70 %                |
| Phase 2 | 25 %            | 75 %                |
| Phase 3 | 15 %            | 85 %                |

## Why coarse, and why more of it with age

Fine limestone dissolves fast and is absorbed during the day. Coarse particles sit in the gizzard and release calcium slowly — so they are still supplying the shell gland at midnight. As the hen ages and shell quality gets harder to hold, the coarse fraction rises to 85%, keeping more calcium available through the overnight calcification window.

## Oyster shell does the same job

Lohmann notes coarse limestone can be partly replaced by oyster shell — same principle, a slow-release calcium source held back for the night shift. The old hands who topped up oyster shell in the afternoon were feeding the clock, whether or not they called it that.

## The point page 1 compressed into one row

The 30/70 → 15/85 shift is not a rounding detail. It is the diet quietly moving calcium supply later into the day, to match when the shell is actually made. Tested directly in Wednesday's research paper — same total calcium, moved in time, measurably stronger shells.

# The pre-lay bridge

Lohmann — correct use of pre-layer feed, developer to Phase 1

## The cliff it exists to cross

Developer feed is low in calcium (~1%) and nutrient density. Layer Phase 1 feed is high in both. Move a pullet straight from one to the other at point of lay and two things go wrong: the sudden calcium jump depresses an already-fragile appetite, and the bird has no medullary bone reserve built up for the first shells.

### THE 4-WEEK FEEDING PROGRAMME (lay scheduled wk 19)

|          | DEVELOPER | PRE-LAY (2.0-2.5% Ca)      |
|----------|-----------|----------------------------|
| Week 15  | 1.0 kg    | → 1.0 kg                   |
| Week 16  | 0.5 kg    | → 1.0 kg                   |
| Week 17  | —         | → 1.0 kg                   |
| Week 18  | —         | → 0.5 kg                   |
| After 18 |           | → start-lay / Phase 1 feed |

## The rules Lohmann puts around it

Use pre-lay for about 10 days only, maximum 1 kg per bird. Start it by sexual maturity and body weight, not a fixed date — for lay at week 19, begin around week 17. It is a compromise feed: too much calcium for rearing, not enough for a bird in full lay. Started too early or fed too long, it does more harm than good.

## What it buys

A smooth calcium ramp instead of a step, so appetite holds through the start of lay, and a primed medullary bone reserve for the first shells. Lohmann flags it as especially valuable for flocks with low uniformity — it lets late-maturing birds catch up while early-maturing birds get the calcium they already need.

## Why it belongs on a phase-feeding deck

Phase feeding is usually told as three laying phases. The bridge into Phase 1 is the phase change people skip, and it is the one where a mistake costs uniformity and early shell quality for the life of the flock.

# Switch on the birds, not the calendar

Lohmann — the phase change is set by production and calcium need, not by age

## Lohmann, verbatim

"The time for switching diets is determined more by the level of production and the need for calcium rather than by age."  
A flock still climbing at 72 weeks does not want its protein pulled because a calendar reached 70. A flock whose egg mass fell away at 60 is being overfed.

## Egg mass trend

The primary switch signal — protein tracks egg mass, not age.

## Shell quality

Thinning shells or more seconds say the calcium strategy needs to move.

## Actual feed intake

The number every percentage divides by — and the one nobody measures per bird.

## The measurement gap

Every figure on this deck divides a daily gram requirement by daily intake. Get the intake wrong and the whole percentage is wrong. Yet intake is what we least often measure — most houses weigh silo throughput and divide by headcount, a flock average that hides the very birds a phase change is meant to protect: the ones that went off feed.

## What it would take to close it

Not a better table — the tables are good. It would take knowing what each group of birds actually ate, continuously, so the percentage on the bag could be matched to the intake in the house instead of the intake in the assumption.  
That is the part nobody is standing in the house long enough to see.

## Save this and check one thing tomorrow

Pull your last fortnight of egg mass and your last shell-quality check.  
If either has moved, the phase decision is due — whatever the week number says.

Based on Lohmann LSL-Lite and Brown-Classic Cage Management Guides — Nutrition sections, Tables 8-12. Full provenance: 01-monday/SOURCES.md