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Calcium nutrition matters more as layers age

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This issue examines why calcium nutrition becomes more important in older laying hens and argues that extended production cycles require more than simply adding more limestone.

Modern laying hens are being asked to do more than previous generations. Longer cycles, higher persistency, and extended egg output have changed the meaning of calcium nutrition. Shell quality is no longer only a late-lay problem. It is the result of pullet development, bone reserves, calcium source, particle size, solubility, intake pattern, and age.

At the same time, many programs still rely heavily on limestone as if all limestone behaves the same. It does not. Limestone varies in calcium concentration, impurities, hardness, particle size, and solubility. Pure calcium carbonate is more predictable, but commercial layer diets often depend on variable natural calcium sources. And that variability matters more as the hen ages.

As hens age, egg size increases and laying percentage decreases. Still, the grams of calcium deposited per egg remain relatively stable, commonly around 2 grams per egg. Thus, the older hen is producing an egg with a similar calcium requirement per egg, but she is doing so through a biological system that is becoming less efficient. Intestinal absorption, bone mobilization, shell-gland function, and intake consistency all become less forgiving with age. The end result can be thin shells, weaker shell strength, and the familiar shell-quality problems of late lay.

Bone reserves become more important
Calcium for shell formation does not come only from the diet. It also comes from medullary bone, especially during the night when shell calcification is active. If pullet skeletal development was incomplete, the older hen enters late lay with fewer reserves. Nutrition can support her, but it cannot fully rebuild what was missed during rearing. In modern genetics, eggshell quality begins at the pullet stage.

Calcium intake becomes less predictable
Older hens may eat less consistently under heat stress, disease pressure, poor feed form, or flock variation. Calcium requirement is daily, but intake is not always steady. This makes calcium concentration, particle size, and feeding management more important than total formulated calcium alone.

Limestone variability becomes costly
A young flock may tolerate some limestone variation. An older flock has less room for error. Limestone can contain from 22 to 38% calcium, and often unknown quantities of other minerals such as magnesium. Low calcium content, excessive impurities, fine particles, or fast solubility can reduce calcium availability during the shell-forming period. The diet may look correct on paper while the bird receives calcium at the wrong time.

Particle size controls timing
Fine calcium dissolves quickly. Coarse calcium remains longer in the gizzard and supplies calcium later, when shell formation is active. Older hens need this timing more than younger hens because their biological margin is narrower. Calcium nutrition is therefore not only about amount, but also about release pattern. Particle size is central to this release pattern, but it is not the whole story. Solubility remains critical at any particle size, especially when calcium timing becomes more sensitive in late lay.

Extended cycles expose weak programs
In a short cycle, some nutrition mistakes remain hidden. In an extended cycle, they accumulate. Poor pullet bone development, variable limestone, weak particle-size control, marginal vitamin D, phosphorus imbalance, and inconsistent intake all become visible as shell quality declines. The longer we push the hen, the more these problems accumulate. The solution is not to react only when hens become old. The solution is to make sure they age well by accounting for late-life calcium needs during pullet development and throughout early lay.

Current genetic guidelines
Major genetic suppliers, in their nutrition guidelines for late-cycle laying hens, generally point toward a calcium intake of approximately **4.5 to 4.7 g per hen per day** once flocks move beyond peak and into extended production. Depending on feed intake, this usually translates into diets around **3.8 to 4.7% total calcium**, with the higher percentages needed when daily feed intake is lower. The important point is not only the percentage of calcium in the diet, but the amount consumed and the timing of calcium release. This is why late-cycle programs increasingly emphasize coarse calcium particles, controlled limestone solubility, and attention to calcium source quality.

In brief, calcium nutrition matters more as layers age because the hen is being used harder and for longer. Modern genetics have extended production, but they have not removed biology.

The older laying hen is like an overused machine. It can keep working remarkably well, but only if the support system becomes more precise. More limestone is not the answer by itself. Older hens need predictable calcium concentration, controlled particle size, suitable solubility, strong pullet development, balanced phosphorus and vitamin D, and steady intake.

In long-cycle layers, calcium is no longer a simple mineral line. It is a lifetime management system.

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