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# 12 ways calcium prevents cracked eggs

*The following checklist verifies layers receive the calcium they need to maintain high levels of production and eggshell integrity.*

The feed nutrient calcium is often associated with eggshell quality problems, which is not surprising considering eggshells contain 94 percent calcium carbonate. A single eggshell weighs about 5-6 grams and at least 2 grams are pure calcium.

A marginal deficiency in calcium will first reduce and then cease ovulation in order to protect a hen's bone integrity. The immediate result of inadequate calcium intake is a rapid increase in cracked eggs and eggs with very thin eggshells. When such problems occur, part of the evaluation process involves monitoring factors that affect hen calcium intake and calcium use. The following 12 nutritional tips can be used to verify layers receive the calcium they need to maintain high levels of production and eggshell integrity.

**1** Calcium hen feed concentration must be at least 4 percent. This should be adjusted according to hen age and feed allowance. In general, hens require at least 4 grams of calcium per day at the beginning of their cycle and as much as 4.5 or more towards the end.

**2** A feed's major source of calcium is usually calcium carbonate (limestone) composed of medium (less than 1mm) and large (2-5 mm) particles in a 50:50 mix. This ratio can be switched to larger particles as hen age increases.

**3** Adding an organic acid may increase calcium absorption in hens at the end of their production cycle.

**4** Oyster shell (coarse) can quickly remedy problems caused by feeding limestone that is too fine. This feed additive is more expensive, but it is preferred for its superior quality.

**5** Hens must have access to calcium in the late afternoon (when eggshell calcification peaks and calcium appetite increases) to ensure maximal and continual eggshell integrity.

**6** Feed chloride levels should not exceed 0.4 percent as excess chloride aggravates calcium deficiency, especially during the summer months. Excess metabolic chloride



depresses a hen's carbonate production, which is required for the formation of calcium carbonate during egg calcification.

**7** Saline water contributes to excess salt intake (chloride is again the problem here). This should be taken into account when checking sodium and chloride total intake levels.

**8** If total chloride intake from water and feed is considered marginally excessive, then any sodium deficiency can be corrected using sodium bicarbonate instead of salt.

**9** Excess phosphorus also will reduce calcium absorption. Total phosphorus should not exceed 0.4 percent in the finished feed.

**10** Vitamin D is integral in calcium absorption and adequate levels should be added to the feed. Adding at least 3,000-4,000 units per kg of finished feed should be adequate for most situations. Adding 25-OH-D3 (calcidiol), the first internal metabolite of vitamin D, has been shown to increase calcium retention in hens.

**11** Certain mycotoxins (zearelanone) are known to bind vitamin D in feed. Water administration of vitamin D is recommended in acute phases of mycotoxin contamination.

**12** A larger egg does not contain more calcium carbonate than a smaller one. A hen deposits around 2 grams of calcium per egg regardless of size. As a result, larger eggs will invariably have thinner eggshells. This problem cannot be resolved by increasing calcium intake. □

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