

TECHNICAL SERVICE



BULLETIN



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AQUA DEE® PROMOTES A HEALTHY AND PROFITABLE RECOVERY FROM BIRD FLU

Avian Influenza has resulted in the loss of 37 million laying hens so far (9.2% of the laying flock).

- There will be a shortage of layers and breeders.
- Egg prices are going up.
- Hens will be kept laying longer.
- It will be a challenge to maintain egg quality.

So everyone will be interested in doing what they can to promote egg shell quality in both breeders and layers.

This is the perfect time to consider how **AQUA DEE** can help offset the cost of A.I. Here's how:

Poor absorption of nutrients from the feed often shows up in birds at 2-4 weeks of age as a result of some irritation to the gut from cocci, toxins from bacteria like Clostridium, mycotoxins, or just plain stress. One of the first symptoms that can show up is due to a deficiency of vitamin D. Birds appear to have weak legs, don't want to move much, have weak, rubbery bones and sometimes try to get around by "wing walking." This is rickets, which is the classic result of vitamin D, calcium or phosphorus problems in growing animals.

In layer or breeder birds, vitamin D is responsible for maintaining strong bones and eggshell quality. As with young birds, if something interferes with the absorption or metabolism of vitamin D, symptoms will appear quickly. First egg shells will be thinner and weaker, and in extreme cases hens will start to lose strength in their legs (cage layer fatigue).

The bird gets the required vitamin D3 either from exposure to sunlight or from the feed. In either case, the vitamin D then goes from the skin or from the intestines through the blood to the liver where it is converted to a form called 25-hydroxy-D3 (25-OH-D3). The 25-OH-D3 is then transported to the kidneys in the blood and there it is again converted to one of several active forms 1,25 (OH)₂ D3 or 24,25 (OH)₂ D3 or 1,24,25 (OH)₂ D3.

If anything goes wrong at any step, even if there is plenty of D3 in the feed, a deficiency can occur and cause problems. So we need to add some D3 in the most readily available form:

1. If birds are not outside, D3 must be in the feed.
2. If gut damage occurs due to bacteria, cocci, mycotoxins or stress, then malabsorption can result and less will be absorbed.

3. If disease or mycotoxins cause liver or kidney damage the chain is broken and deficiency symptoms again show up.
4. If breeder layers do not get enough D3, they do not put enough into the egg and then the embryo can die or not have enough stored vitamin to grow properly in the first weeks of life before they start getting enough from the feed.
5. As hens age, eggs usually get larger. But only so much shell can be deposited in a given time, so shells get thinner. Even if egg size is controlled, the efficiency of the shell gland seems to get worse with age.

Adding water dispersible **AQUA DEE** will help in all of these situations.

1. Extra D3 in the feed will help, up to a point, because if more is present more can be absorbed as long as there are no malabsorption problems (mycotoxins, enteritis, etc.).
2. **Water dispersible D3 powder is absorbed better than regular feed grade D3 because it is a very small particle that has a polar coating (starch or gelatin) that acts like a surfactant or soap.**

This coating makes it form a micelle easier. This is necessary because D3 is fat soluble and will not be absorbed with the fat that is in the diet without first forming a micelle. A micelle is a very small drop of fat (or fat soluble vitamin) surrounded by molecules of surfactant or "soap." The surfactant has a fat soluble end and a water soluble end so that the droplet of fat or D3 can be suspended in the water in the gut and then be absorbed.

In a quality Vitamin D3 LIQUID product like AQUA DEE, the micelles are pre-formed. This means that the D3 can be readily absorbed as-is.

3. Water dispersible and feed grade versions of 25-OH-D3 are available and are absorbed like D3. It has an advantage in that it skips the "liver processing" step. So if there is liver damage, it may be worth using some 25-OH-D3 until the damage is repaired.

The disadvantage is that most of the vitamin D is stored in tissues as D3 and is processed through the liver as needed into 25-OH-D3. **So if it enters the system as 25-OH-D3 after the bird eats, little is stored if there is more available than needed or if the timing is not right to match the body's need.** So 25-OH-D3 can help in some cases but it cannot replace D3.

4. If D3 cannot be added as **AQUA DEE** through the water, then the next best solution is to add a feed-added but water dispersible source of D3 like **FIRM-O-SHELL®** (at 2.5 pounds per ton). **FIRM-O-SHELL** contains water dispersible D3 plus additional vitamins A and E and proteinated trace minerals (which are also absorbed better).

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