

ASCORBIC ACID IMPROVES EGG SHELL QUALITY IN PRESENCE OF SALINE DRINKING WATER

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Recent studies have shown that the supply of saline drinking water to laying hens significantly reduces egg shell quality and significantly increases the incidence of egg shell defects (Balnave and Yoselewitz, 1987). Attempts to overcome the problem have generally proved unsuccessful. Methods used have included deleting the NaCl supplement from the diet, supplementing the diet with additional CaCO₃, resting hens from lay and replacing saline water with town water. The present studies examined the merits of ascorbic acid, a vitamin reported to have beneficial effects in poultry exposed to environmental or nutritional stress.

Two studies were conducted with two replicates of six 40-week-old (Experiment 1; Strain 1, duration 8 weeks) or forty 68-week-old (Experiment 2; Strain 2, 6 weeks duration) laying hens. Experiment 1 was conducted in a temperature-controlled room at 30°C and Experiment 2 in a commercial layer shed (maximum daily temperature 20°-35°C). Hens received a proprietary layer mash and one of four treatments applied via the drinking water. Treatment 1 (T1) received town water and treatments 2, 3 and 4 received town water supplemented with 2 g NaCl/l (T2), 1 g ascorbic acid/l (T3) and 2 g NaCl plus 1 g ascorbic acid/l (T4) respectively. Hens were given free access to food and water and received 16 h light/d. Ascorbic acid was added to fresh supplies of drinking water daily at 1600 h. The results are shown in the Table.

Treatment	Shell defects (%)		Shell weight: egg weight (X100)		Shell weight/unit surface area	
	Expt/ 1	2	1	2	1	2
T1	2.3 ^a	7.3 ^a	8.65 ^a	9.04 ^a	72.0 ^a	76.0 ^a
T2	13.4 ^b	15.4 ^b	8.22 ^b	8.26 ^b	67.9 ^b	70.0 ^b
T3	1.6 ^a	6.0 ^a	8.72 ^a	9.11 ^a	72.6 ^a	76.4 ^a
T4	4.9 ^a	7.5 ^a	8.50 ^{ab}	8.88 ^a	70.5 ^{ab}	74.7 ^a

Values within a column with different superscripts differ significantly (P<0.05)

Adding NaCl to the town water adversely affected the incidence of shell defects and shell quality. These effects were ameliorated when ascorbic acid was supplied with the NaCl. A slight, non-significant effect of ascorbic acid was also observed when it was added to the town water. The use of ascorbic acid is one way of off-setting the damaging effects of saline drinking water on egg shell quality.

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