Keel bone deformities in laying hens

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Several studies have shown a high prevalence of keel bone deformities in alternative housing systems of laying hens. In an experimental study, we assessed the impact of perch material, a vitamin D feed additive (Hy•D), and genetics on keel bone pathologies. The study consisted of two experiments. In the first experiment, 4000 Lohman Selected Leghorn hens were raised in aviary systems until 18 weeks of age, half of them got Hy•D throughout the study. Afterwards, the hens were moved to a layer house with eight pens equipped with two different commercial aviary systems. Every 6 weeks, the keel bones of 10 randomly singled out animals per pen were palpated and scored. In the second experiment, we used 2000 Lohman Brown (LB) hens and 2000 female Lohman Brown parent stock (LBPS) hens. Half of them got Hy•D throughout the study. During the laying period, the hens were kept in 24 identical floor pens, but equipped with different perch material (plastic or metal). No keel bone deformities were found during the rearing period. During the laying period, deformities gradually appeared and reached a prevalence of 35% in the first and 43.8% in the second experiment at the age of 65 and 62 weeks, respectively. In the first experiment, neither Hy•D nor the aviary system had any significant effect on the prevalence of keel bone deformities. In the second experiment, LBPS had significantly fewer moderate and severe deformities than LB hens, and metal perches were associated with a higher prevalence of keel bone deformities as compared to plastic perches. The parent stock layed more, but smaller eggs than LB. Again, Hy•D did not affect the prevalence of keel bone deformities. However, the significant effect of breed affiliation strongly indicates a sizeable genetic component which may provide a basis for targeted selection.