

Technical information

Incubation lighting schedules and their interaction with matched or mismatched post hatch lighting schedules: effects on broiler bone development and leg health at slaughter age

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The incidence of leg pathologies in broiler chickens with a developmental origin may be decreased by stimulating embryonic bone development through lighting schedules during incubation, but this may depend on post hatch lighting conditions. Aim was to investigate how lighting schedules during incubation and their interactions with matched or mismatched lighting schedules post hatch affected bone development and leg health at slaughter age. In a 3x2 factorial designed experiment, eggs were incubated under continuous cool white LED light (Inc24L), 16h of light, 8h of darkness (Inc16L:8D), or continuous darkness (Inc24D) from set till hatch. After hatch, broilers were housed under continuous light (PH24L, to match Inc24L and Inc24D) or 16h of light, 8h of darkness (PH16L:8D, to match Inc16L:8D). Gait scores were determined on D21, D28, and D34. After slaughter on D35, legs were scored for varus-valgus deformities, rotated tibia, tibial dyschondroplasia, bacterial chondronecrosis with osteomyelitis (BCO), epiphyseolysis, and

epiphyseal plate abnormalities from 1 = absent to 4 = severe. Femur and tibia dimensions and mineral density were also determined on D35. On D35, Inc24L led to more epiphyseal plate abnormalities than Inc16L:8D or Inc24D, and Inc24D led to more BCO than Inc16L:8D. Gait scores on D21, D28, and D34, and bone dimensions did not differ between treatments. Inc24L led to higher femur mineral density on D35 than Inc24D with Inc16L:8D intermediate. Providing a chicken with a matched post hatch lighting schedule did not affect most measurements of bone development and health. It can be concluded that a circadian incubation lighting schedule may improve leg health in broilers.

Key words: incubation, lighting schedule, bone development, leg health

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