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Title: Which light colours do broiler chickens prefer for drinking and feeding?

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Abstract: Although lighting technology is evolving rapidly, little is known about the light characteristics chickens prefer for different activities. We evaluated light colour preferences of broilers for drinking and feeding, and whether such preferences are affected by age, enrichment (platforms) or heat stress. The experiment included four rounds. Per round, 560 one-day-old male chicks (Ross 308) were equally allocated to four pens (9×4m) for 43 days. Each group was assigned to one of four treatments: No platforms-Thermoneutral, Platforms-Thermoneutral, No platforms-Heat stress, and Platforms-Heat stress. Heat was induced during d29 to d40 with 32°C for 6h/day. The feeding and drinking line in each pen consisted of 3 distinct feeder and drinker areas. LED technology was used to illuminate these 3 areas with different light colours: Ref-white-3000k, Red and Cyan for the feeders, and Ref-white-3000k, Cyan and Yellow for the drinkers. Broilers were free to choose where to feed and drink. Day time occupation rates of each drinker and feeder area were determined for the entire experiment using computer vision. Data was analyzed with linear mixed effects models with interaction of light recipe, platforms and heat as fixed effect and daily repeated measures as random effect. During starter phase (1–10d) broilers preferred White light for drinking ($P<0.001$) and avoided Red light for feeding ($P<0.001$) as compared to other light colours. During grower phase (11- 24d), for drinking, White light was still preferred over Cyan ($P=0.003$), but the difference with Yellow light was not significant. During finisher phase (25–43d) broilers avoided Cyan light for drinking ($P=0.001$) and preferred it for feeding ($P=0.003$). Light preferences were not influenced by enrichment or heat. Broilers have different light colour preferences for feeding versus drinking, and these preferences seem robust to various environmental conditions (enrichment and heat) but change as birds age.