

Tree-ranging broiler chickens: how silvopasture impacts ranging behavior

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Free-range access for broiler chickens can benefit bird welfare by providing opportunities to express highly-motivated normal behaviors, yet chickens' range use can be limited. Providing access to silvopasture, a range with trees that serve as a source of income for the producer, may benefit ranging behavior. The objective was to determine the impact of pasture type (silvopasture; SP or open grass pasture; OP) on range use in fast-growing broiler chickens. Day-old mixed-sex Ross 708 chicks (n=648) were housed indoors until day 23 of age and then moved to coops within six 125m² SP plots (\bar{x} =32% canopy cover) or six OP plots (without canopy). Birds had access to the range between 8:00-17:00h. Plot-level range use (% of the flock outside) was observed on days 29, 30, 34, 35, 40, and 41 of age. Data were analyzed with mixed models in JMP Pro with treatment, age (week; wk), and their interactions as predictors, tested by time of day (morning, midday, afternoon), with plot ID as random factor. Data are presented as LSmeans \pm SEM. More birds ranged in SP compared to OP (14.6 \pm 1.1% versus 9.1 \pm 1.1%; $F_{1,10}$ =13.21, $P=0.005$). In the morning, more birds ranged in SP (29.0 \pm 1.6%) compared to OP (21.5 \pm 1.6%; $F_{1,10}$ =11.44, $P=0.007$), and more birds ranged in wk5 (30.0 \pm 2.2%) and 6 (31.7 \pm 2.2%) compared to wk4 (14.1 \pm 2.2%; $F_{2,272}$ =17.20, $P<0.001$). At midday, more birds ranged in SP in wk5 (4.0 \pm 0.9%) compared to OP in wk5-6 (0.3% and 0.1 \pm 0.9%) and compared to SP in wk6 (0.9 \pm 0.9%; $F_{2,200}$ =3.62, $P=0.029$). In the afternoon, more birds were ranging in SP in wk5 (11.4 \pm 1.6%) compared to OP in wk4-6, and to birds in SP in wk6 (4.4 \pm 1.5%; $F_{2,200}$ =7.57, $P<0.001$). This study confirms broilers' preference for pastures with natural overhead cover over open grassland and illustrates the importance of natural overhead vegetation in the range for broiler chicken welfare.

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