Effect Of 1-D Old Chicken Quality And Spray-Dried Plasma Supplementation In Broilers

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Spray-dried plasma (SDP) modulates immunity, improves gut health, gut functionality, and overall performance in chickens (Campbell et al., 2019). 1d-old chicks of low quality underperform at processing age. The effect of feeding SDP to chicks of different quality was assessed. Cobb 500 1d-old chicks were weighed individually at arrival and divided into groups of 36.6 or 44g of BW on average. Groups T1 to T4 had access to feed and water about 12h after hatching, and groups T5 & T6 were fasted an additional 12h (24h in total). Birds were fed iso-nutritional diets with 0 or 2% SDP replacing soybean meal from 0 to 7d of age, and a common dietary program thereafter (T1= 36.6g + Ctrl; T2= 36.6g + SDP; T3= 44g + Ctrl; T4= 44g + SDP; T5= 36.6g + SDP + 24h; & T6= 36.6g + SDP + 24h). Each group had 10 floor pens of 50 birds each. Data were analyzed as a Factorial 2x3 design. At 7d of age, SDP improved BWG, intake and FCR in 36.6 and 44g birds but more noticeably in 36.6g birds. At 42d of age, SDP improved intake ($P=0.053$) and BWG ($P<0.05$) vs Ctrl in 36.6g (T2= 2962 vs T1= 2881g of BWG) greater than in 44g birds (T4= 2906 vs T3= 2896g of BWG). No differences in FCR were found at 42d but this parameter was particularly good in all birds (1.54 on average). Fasting 36.6g birds for 24h (T5 & T6) reduced performance at all ages and SDP did not affected performance in this group. Feeding SDP improved carcass weight and yield by 70g & 1.48%, respectively. These improvements were larger in 36.6g birds (144g & 2.75%, respectively) rather than 44g birds (41g & 1%, respectively) or vs 36.6g + 24h (24g & 0.68%, respectively). At 15d, SDP increased villi number from 42.3 to 44 per 1000 µm2 ($P<0.03$) and absorptive area per µm2 from 9.75 to 10.61 ($P<0.0001$) in the duodenum; and ileum absorptive area from 6.91 to 7.44 per µm2 ($P<0.01$). At 42d, cold carcass skin pigmentation (*b; yellowness), increased with SDP in all groups (41.86 vs 42.76; $P=0.06$). In conclusion, feeding SDP improved performance at 7d and 42d, and carcass parameters with greater responses observed in 36.6g vs 44g chick. Small chicks fasted for 24h showed the lowest intake and BWG of all groups and were unable to respond to SDP. Overall, SDP improved gut development and gut functionality regardless of chick quality.

Key Words: Chick quality, Spray-Dried Plasma, Performance, Carcass, gut morphology