

A Comprehensive Meta-Analysis On The Effect Of Feeding Spray-Dried Plasma On Broiler Performance

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Spray-dried plasma (SDP) modulates immunity, improves gut health, gut functionality, and performance in chickens (Campbell et al., 2019). A meta-analysis on the effect of cumulative SDP intake (g/bird) on BWG, feed intake, FCR and livability of broilers was performed. Performance was expressed in percentage as the difference between each SDP treatment performance relative to the control (i.e., $\Delta\text{BWG} = (\text{BWG}_{\text{SDP}} - \text{BWG}_{\text{Control}}) / \text{BWG}_{\text{Control}} * 100$). An extensive search of the scientific literature yielded 29 trials with 92 SDP vs Control comparisons. SDP intake was estimated from the SDP levels used in each treatment and its corresponding feed or water intakes. The inverse-variance method for quantitative continuous variables, weighted by the number of replicates per study, was used. Studies were divided into challenge (i.e. by a pathogen, heat stress, or if mortality was $\geq 10\%$ for any treatment) or non-challenge conditions. The effect of SDP intake from trials feeding SDP in the first feeding phase only (starter only) was assessed. Four data sets were analyzed: overall (all data), challenge, unchallenge, and starter only. The impact of SDP intake was assessed at the end of the first starter phase or at the end of the trial when ended at ≥ 32 d of age (slaughter age). Overall, feeding SDP improved ΔBWG , ΔIntake , ΔFCR & ΔLiv during the starter period ($P < 0.05$). Challenged birds had greater ΔBWG (6.1 vs 3.6%) & ΔIntake (4.5 vs -0.2%) response vs unchallenged. At slaughter age, SDP improved all parameters. Greater responses were seen in broilers under challenge vs those unchallenged. Feeding SDP in the starter diet only, resulted in similar improvements when compared to overall estimates indicating that most of the value of feeding SDP in broilers is realized when fed in the first few days of life. During the starter phase, feeding 3g of SDP/bird increased ΔBWG by 4.0 vs 3.7%; ΔIntake by 4.9 vs -0.7%; ΔFCR by 0 vs -2.0 & ΔLiv by 0 vs 0.2% for broilers under challenge vs unchallenged, respectively, as estimated by regression equations. At slaughter age, ΔBWG by 2.0 vs 2.3%; ΔIntake by 0.5 vs 0.2%; ΔFCR by -5.2 vs -2.5 & ΔLiv by 2.1 vs 1.3% for challenge vs unchallenged broilers, respectively. The main improvement observed with SDP at slaughter age was ΔFCR , ΔBWG & ΔLiv .

Key Words: Meta-analysis, Spray-Dried Plasma, Performance, Livability, Broilers