

## Broiler Performance by Supplementing Diets

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### Description

Antibiotics have been regularly used as growth promoters in the chicken industry for over 60 years (Libby and Schaible, 1955). On the other hand, antibiotic abuse causes issues such as antibiotic residues, the formation of antibiotic-resistant bacteria, and the development of microbiota disruption, all of which can contaminate poultry products and constitute a major hazard to human health (Boerlin and Reidsmith, 2008; Stanton, 2013). As a result, various alternatives to growth-promoting antimicrobials have been investigated (Huyghebaert et al. 2011). These techniques have centered on preventing harmful bacteria from multiplying and manipulating beneficial gut microflora to promote health, immunity and performance (Adil and Magray 2012). However, the emergence of antibiotic-resistant microorganisms forced researchers worldwide to employ non-therapeutic and nutraceutical approaches. As a result, probiotics have attracted more interest as a potential replacement for antibiotic growth promoters to induce growth and maximize the genetic potential of modern broiler breeds (Dhama et al. 2011). Probiotics supplementation in broiler feed, on the other hand, did not influence broiler performance (Rehman et al., 2020) and the microorganism in the small intestine (Abd El-Hack et al., 2020). On the other hand, several studies have indicated that adding prebiotics to the diets of broiler, layer, and pigs improves performance by boosting gut microbiota (Xu et al., 2003; Pelicano et al., 2004).

### Productive Performance

Live body weight (LBW), body weight gain (BWG), feed intake (FI) and feed conversion ratio (FCR) as affected by dietary treatments. Synbiotics are characterized by antibacterial, anticarcinogenic, antiallergic, and immunestimulating properties when prebiotics and probiotics are combined in a single dose. It also enhances mineral absorption, prevents diarrhoea, and optimizes nutrient digestive processes (Gruzauskas et al., 2004). In reality, the advantage of synbiotics and a major rationale for their use is that without a prebiotic, a probiotic would have a hard time surviving in the environment because prebiotics is probiotics' food supply. Therefore, it is advised to refer to the symbiotic due to the beneficial and synergistic benefits of employing a mixture of probiotics and prebiotics. The goal of this study was to investigate how various effective probiotics

and symbiotic preparation additives in broiler chicken meals can affect growth, carcass features, gut bacteria count, and blood parameters.

Probiotics in broiler diets have been proven to boost growth performance when used instead of antibiotic growth promoters in several studies (Shim et al. 2010; Wang and Gu 2010; Zakeri and Kashefi 2011). In addition, Eckert et al. (2010) Kavazovi et al. (2009) Manafi et al. (2018) found that probiotics improve growth performance and humoral immune response and leave no residues in meat that could be harmful to consumers' health. Probiotics alter the intestinal ecosystem by delivering digestive enzymes, lowering pH (Kabir, 2009; Abd El-Hack et al., 2020) and influencing intestinal bacteria. Supplementing with probiotics improved carcass yield, live weight, immunological response, and the appearance of prominent cut up meat pieces (Soomro et al., 2019). In addition, probiotics in broiler diets proved in multiple trials to boost growth performance compared to controls and are as effective as antibiotic growth promoters (Denl et al., 2003; Bai et al., 2013). However, according to Salehimanesh et al. (2016), the addition of antibiotics and probiotics has little effect on broiler growth performance, especially in good hygienic circumstances. Toghiani et al. (2011) discovered that utilizing probiotics at a dose of 15 mg/kg can dramatically improve live body weight (LBW), feed conversion ratio (FCR), and feed intake (FI) compared to the control group. Pourakbari et al. (2016) discovered that adding probiotics to broiler diets up to 0.02 percent increased DBWG and improved FCR, but probiotics had no effect on FI. Similarly, Machado et al. (2020) found that supplementing broiler diets with probiotics improved LBW and increased FI, while there was no effect on FCR.

### Lymphoid Organs %

Regarding lymphoid organs weight %, different feed additives to basal diet (T2-5) exhibited no significant differences in the spleen, bursa and thymus% compared to control. The finding of the present study showed agreement with the observations of Awad et al. (2009), Naseem et al. (2012) who did not report any significant differences in lymphoid organs values due to probiotic supplementation. The lowest count of log<sub>10</sub> CFU/g of pathogenic bacteria observed in broiler chickens that were fed T4 diets, being (2.72 vs. 4.79) for E. Coli and (2.40 vs. 4.83) for salmonella count compared with the control group. Similarly,

the highest counts (log 10 CFU/g) of beneficial bacteria were observed in the small intestine of broilers that were fed (T3 and T4) diets.

It is worth to note that chicks fed the control diet without probiotic or symbiotic during different periods reflected the lowest significant result in LBW or BWG compared with other dietary treatments (T2- 5). On the other hand, chicks fed diet supplemented with (250 g balacto, T4) gave higher BWG (2284.90 g) compared with those fed diets supplemented 250 g of (lacto-pro, T2), (Baillus-fort, T3) or 500 g of zado (T5) being 2132.15, 2136.15 and 2132.50 g, respectively. The differences

were statistically significant. The synergistic effect between probiotic and prebiotic may improve nutrients utilization, metabolism and absorption and would maintain better environment in digestive tract (Yang et al 2009). Similarly, Awad et al (2009) reported beneficial effects of symbiotics over a probiotic on productive performance. These results agree with those reported by many investigators. Murshed and Abudabos (2015) found significant higher body weight gain due to inclusion of symbiotics, while, Willis et al. (2008) and Mountzouris et al (2007) reported that addition of prebiotic, probiotic or symbiotic to broiler diets had no significant effect on body weight.