

Effect of propolis supplementation on performance, intestinal morphology, and bacterial population of broiler chickens: A meta-analysis

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Abstract

The present meta-analysis examined the effect of dietary propolis supplementation on growth performance, bacterial population, antiviral serum concentration, intestinal morphology and digestive enzyme activities in broiler chickens. A total of 40 articles were included in the database after strictly selected using the PRISMA protocol. Data were analysed according to mixed model analysis, in which the different studies were considered as random effects while the level of propolis inclusion was declared as the fixed effect in the model. Propolis supplementation quadratically influenced broiler performance parameters, i.e. body weight (BW) and average daily gain (ADG) but did not affect average daily feed intake (ADFI). However, propolis supplementation significantly improved the feed conversion ratio (FCR) following a linear pattern. According to the models, optimum inclusion levels of propolis for these parameters were between 256 to 262 mg/kg feed to obtain optimum ADG and final BW. There was a tendency of mortality decrease due to propolis supplementation. Propolis inclusion had no any effect on serum antiviral concentration, bacterial population, and intestinal morphology. Among digestive enzymes, only sucrase linearly increased as propolis inclusion increased. In conclusion, propolis supplementation positively increased growth performance of broiler chickens and the effect is dose dependent that is optimized at ??? mg/kg feed. Part of such improvement is probably due to an improvement on sucrase activity and other factors related to nutritional content of propolis. Future study to evaluate specific bioactive compounds of propolis responsible for the improvement is therefore demanding.

Keywords: broiler chicken; enzyme; meta-analysis; propolis

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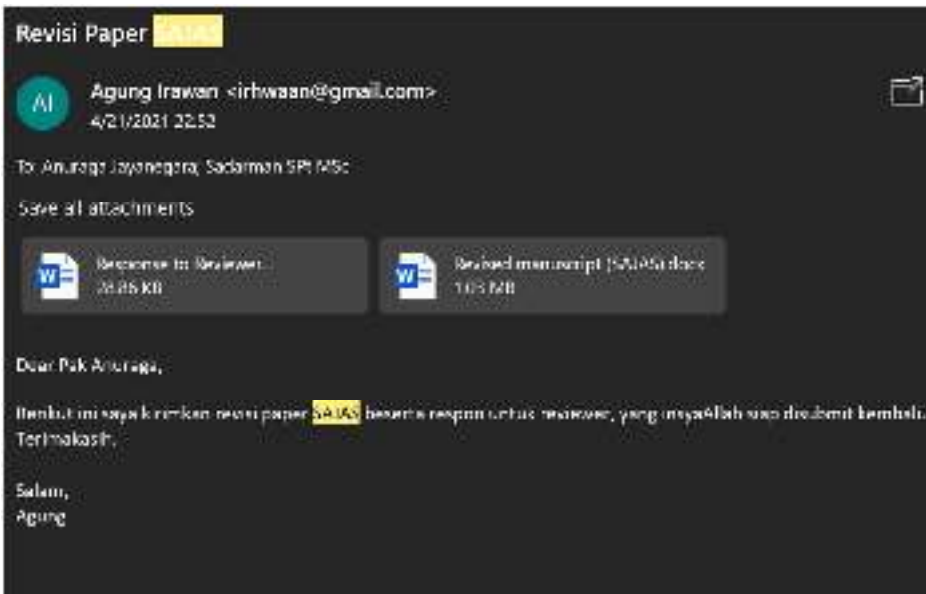
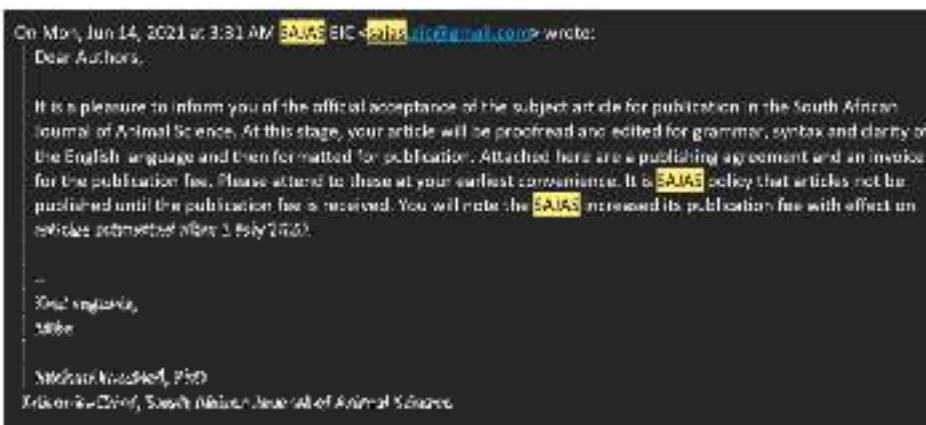
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