

Providing optimal nutrients to broilers depending on the purpose of production

An adequate supply of nutrients in feeds is of importance in poultry production. For broiler chickens, dietary nutrients will be mainly used for protein and fat deposition. On the other hand, broiler breeders will mainly use dietary nutrients for reproduction.

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Therefore, nutritionists have focused on providing optimal nutrients to birds depending on the purpose of production. To facilitate nutrient utilisation and maximise the feed efficiency of birds, various feed additives have been used in feeds for broiler chickens.

Among many nutritional feed additives that can increase the digestibility of nutrients, Lipidol has been widely used around the world due to its unique features.

Lipidol contains lysophospholipids (LPLs), which can enhance the absorption of nutrients into epithelial cells in the gastrointestinal tract.

Many previous research trials have been conducted and verified the positive effects of Lipidol in broiler chickens.

Moreover, a recent study showed that Lipidol has beneficial effects on the reproductive performance of broiler breeders.

In this article, the mode of action of LPL was introduced to describe how LPL can improve the absorption of nutrients in feeds and practical applications of Lipidol in broiler chickens and breeders were provided to demonstrate the broad application of Lipidol in overall broiler production.

Lysophospholipids: mode of action as a nutrient absorption accelerator

Enzymatically digested nutrients are absorbed into intestinal epithelial cells by passing through the cell membrane. The epithelial cell membrane consists of phospholipids, which carry one hydrophilic phosphate head and two hydrophobic fatty acid tails.



Due to its amphiphilic characteristic, phospholipids form a bilayer as a membrane, where phosphate heads face either the lumen or intracellular area and fatty acid tails face another fatty acid tails on the opposite side of the layer.

The epithelial cell membrane is fluid, and therefore, the fluidity of the cell membrane affects the absorption rate of nutrients.

Lysophospholipids contain one phosphate head and one fatty acid tail. Since LPLs and phospholipid have similar structures, dietary LPLs can be immediately incorporated into the epithelial cell membrane and increase the fluidity of cell membrane.

Increased fluidity of the cell membrane expands the surface area of cell membrane, thereby more nutrients in the lumen can be attached to the cell membrane.

In addition, the activity of transporter proteins is positively affected by the increased fluidity of the cell membrane.

Improvements in growth and reproductive performance

In the research trial conducted to determine the effects of Lipidol on the growth performance of broiler chickens, a total of 112 birds (Arbor Acres; Aviagen) were assigned to two dietary treatments at day 0 post hatching. There were seven replicates per treatment with eight birds per replicate in this trial.

Dietary treatments were prepared for two phases: the starter phase from day 0-14 and the finisher phase from day 14-42. Control diets were prepared based on corn and soybean meal, and Lipidol was added at 0.1% to control diets at the expense of corn.

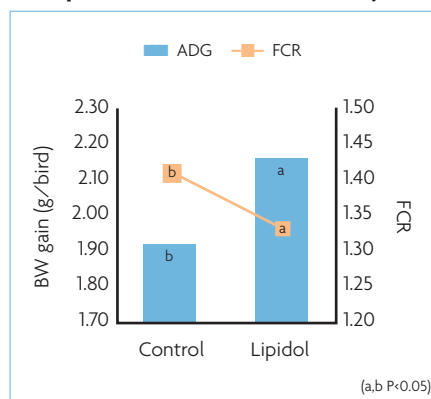
From day 0-42 of the experiment, broiler chickens fed the diets containing Lipidol had greater ($P < 0.05$) body weight (BW) gain than those fed the control diets (2.16kg vs. 1.92kg/bird; Fig. 1).

In addition, the feed conversion ratio (FCR) of birds fed the diets containing Lipidol was also significantly improved ($P < 0.05$) by 7% compared to those fed the control diets. This trial demonstrated that feeding Lipidol supported the absorption of nutrients in the small intestine, leading to the improvements in growth performance of broiler chickens.

Another research trial was recently conducted with broiler breeders to

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Fig. 1. BW gain and FCR of broiler chickens fed Lipidol at 0.1% of diets for 42 days.





those fed the control diet (74.0% vs. 77.3%; Fig. 2). There was a tendency ($P < 0.10$) for greater hatchability of eggs in birds fed Lipidol than in those fed the control diet (92.5% vs. 93.9%).

Furthermore, birds fed the diet containing Lipidol had significantly increased ($P < 0.05$) egg weight and egg mass by 1% and 8%, respectively, compared to those fed the control diet (Fig. 3). Based on the results of this trial, it can be concluded that improved nutrient absorption by feeding Lipidol increased the reproductive performance of broiler breeders.

Fig. 2. Egg production and hatchability of broiler breeders fed Lipidol at 0.05% of diets for 12 weeks.

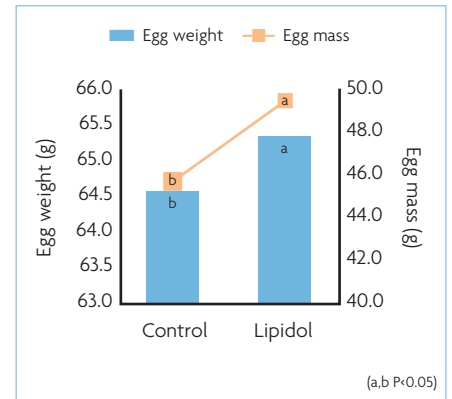
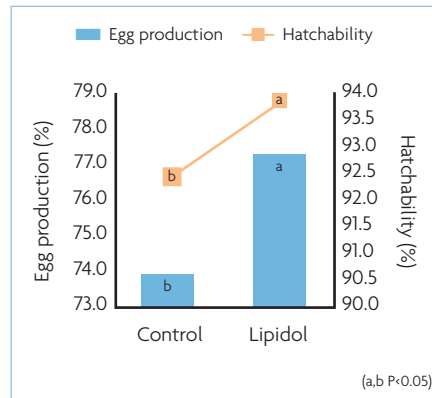


Fig. 3. Egg weight and egg mass of broiler breeders fed Lipidol at 0.05% of diets for 12 weeks.

Conclusion

Lipidol carries a unique mode of action as the nutrient absorption accelerator. Recent trials confirmed that feeding Lipidol is beneficial not only for meat-producing broiler chickens but also for broiler breeders. Increased egg production and hatchability of eggs by feeding Lipidol will significantly improve the overall profit of broiler production, together with improved growth performance and FCR of birds. Using Lipidol in a wide range of broiler production will reduce the excretion of undigested nutrients. ■

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determine the effects of Lipidol on egg production and quality of birds. A total of 308 broiler breeders (Ross 308; Aviagen) were allocated to two dietary treatments at 50 weeks of age. There were 14 replicates per treatment with 11 birds per replicate in this trial.

Dietary treatments were prepared based on corn and soybean meal, and Lipidol was added at 0.05% into the control diet. Birds were fed the experimental diets for 12 weeks. During 12 weeks of the experimental period, egg production of birds fed the diet containing Lipidol was greater ($P < 0.05$) than