

Vega Bile acids(BilePro) reduce costs & increase profit of broiler

Bile Acids can be used to optimize formulation and reduce feed costs by:

- 1. Reduce 3-5kg oil and 30-50Kcal metabolisable energy in the formulation;**
- 2. Activate and improve the activity of digestive enzymes and reduce the protein level of 1% in the formulation;**
- 3. Optimize the use of feed additives;**
- 4. Reduce fat-soluble vitamins and pigments in the formulation by 20%.**

There is no need to worry too much about the cost of adding bile acids, because the above measures can be combined to optimize the formula after the use of bile acids. Our purpose in providing bile acids is to help feed companies reduce rather than increase formula costs, and to ensure feed effectiveness and poultry growth performance.

How to help feed enterprises reduce formula costs and create more profits?

With the rapid growth of the industry, the market competition is becoming more and more fierce. Feed enterprises are facing the cost pressure of raw materials, labor, transportation and other aspects. On the premise of not affecting the quality of feed, only by effectively reducing the cost of formula and improving the competitiveness of products in the same industry can create more profits.

BilePro can improve the utilization of fats, proteins and fat-soluble nutrients. Bile acids also have outstanding contributions in protecting poultry liver health. Therefore, bile acids provide a new idea for the industry to save raw materials and feed enterprises to reduce feed costs.

1.Reduce 3-5kg oil and 30-50Kcal metabolisable energy in the formulation

The bile acid molecule contains both hydrophilic hydroxyl group and carboxyl group, as well as lipophilic alkyl group, so that the bile acid has a strong surface activity. This reduces the surface tension between oil and water, promotes the emulsification of oil, expands the contact area between oil and the lipase and prepares oil for full digestion. Bile acids not only assist lipase, but also enhance the activity of lipase. The function of lipase is best when the pH is 8-9. However, in the front of the small intestine, the pH is 6-7, where the lipase actually doesn't work. When the lipase forms a complex with bile acids, the properties of the lipase change and work in the small intestine with a pH of 6-7. Meanwhile, bile acids cluster around the products of fat digestion to form structures called micelles, which help the fats get close enough to the microvilli of intestinal cells so that they can be absorbed. After using bile acids to improve the utilization of oil, the oil and metabolizable energy in the formulation can be reduced.

Bile acids can also activate FXR, GTR5, and promote the metabolism of fat and sugar.

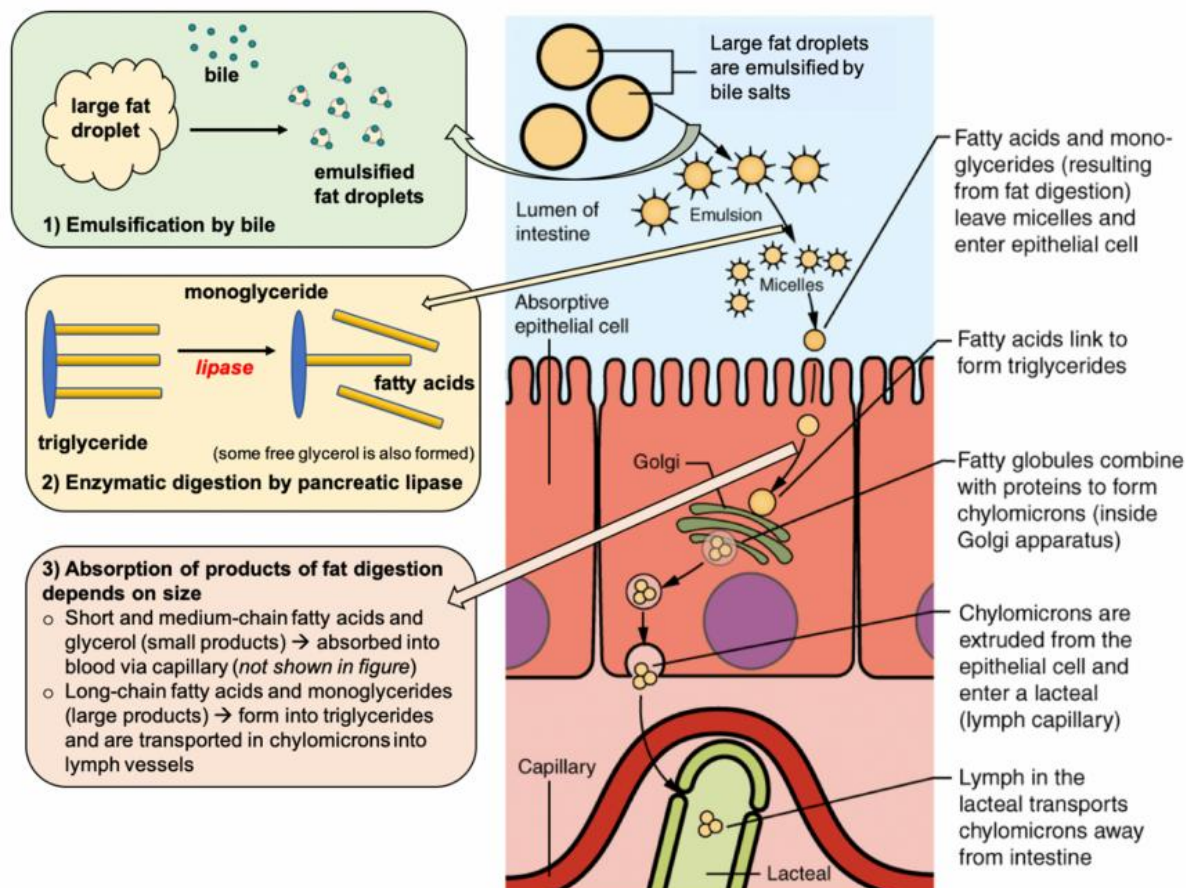


Figure 5.22. Lipid digestion and absorption in the small intestine.

<https://openoregon.pressbooks.pub/nutritionscience/chapter/5d-digestion-absorption-lipids/#:~:text=Digestion%20and%20Absorption%20of%20Lipids%201%201.%20Lipid,4%204.%20Lipid%20Absorption%20from%20the%20Small%20Intestine>

2. Activate and improve the activity of digestive enzymes and reduce the protein level of 1% in the formulation

Here is an experiment in which bile acids increase the activity of lipase:

Experimental animal: Four hundred thirty-two 1-day-old AA+male broilers

Experimental design: Broilers were randomly assigned to 4 treatments with 6 replicates of 18 chicks each for 42d. The experimental treatments received a corn-soybean basal diet and were as follows: 0 (control), 40 mg, 60 mg, and 80 mg bile acids/kg of diet.

Experimental results:

Effect of bile acids on intestinal enzyme activity of broilers at the age of d 21.¹

Item ²	Content of Bile acids(mg/kg)			
	Control	40	60	80
Duodenum				
HSL(U/g)	50.92	49.35	50.47	51.27
LPL(U/mg)	10.23a	24.24b	22.35b	22.81b
LPS(U/g)	10.26a	20.89b	19.89b	20.15b
Jejunum				
HSL(U/g)	39.22	39.60	39.78	39.90
LPL(U/mg)	17.27	16.98	18.34	17.98
LPS (U/g)	14.64	14.78	15.14	15.06
Ileum				
HSL (U/g)	30.30	28.98	30.09	29.68
LPL(U/mg)	18.58	18.04	18.34	18.42
LPS (U/g)	16.05	16.14	15.98	16.17

¹Values are the means of 6 replicate pens of 18 birds.

²HSL=Hormone sensitive lipase; LPL=Lipoprotein lipase; LPS =Lipase.

Conclusion: Supplementation of diets with bile acids can effectively enhance the activity of intestinal lipase and lipoprotein lipase.

We also have other experiments prove that bile acids increase the digestibility of protein and oil in finisher broilers by 25%.

3.Optimize the use of feed additives;

3.1 Bile acids run through the whole process of fat emulsification,digestion and absorption,while emulsifiers only play a role in the emulsification stage

3.2 Bile acids can promote the synthesis of very low density lipoprotein (VLDL),which accelerates the transport of fat from the liver to the extrahepatic tissues and reduces the deposition of fat in the liver.As a signaling molecule,bile acids can increase the level of SREBP-1c and inhibit lipid synthesis. PPARα levels can also be increased by bile acids to promote lipidolysis,preventing fat synthesis and gluconeogenesis in the liver.For these reasons,bile acids are the preferred additive to protect the liver health of poultry.

Therefore,bile acids can completely replace emulsifiers and liver tonic.

3.3 Bile acids can also improve the enzymatic hydrolysis ability of intestinal enzymes

(esterase,cyclooxygenase) to mycotoxins.Studies have also shown that bile acids can promote the expression of foreign-substance-metabolizing enzymes (Cyp3A37,Slcolb3,Cyp1A4 and Ces1,etc.) related to mycotoxin metabolism by activating the FXR signaling pathway in the liver,and accelerate the clearance of mycotoxin in the blood.As a result,the amount of mycotoxin absorbents can be reduced by 50%.

4.Reduce the fat-soluble vitamins and pigments in the formula by 20%.

Fat-soluble vitamins (vitamin A,D,E,K)and some pigments are insoluble in water, but soluble in fat.Their absorption in the body is usually related to lipids,these fat-soluble vitamins and pigments are used by the body as the body absorbs lipids. So when the utilization rate of fat in the feed is increased by bile acids,the utilization rate of these vitamins and pigments is also increased.

Here are two examples of bile acids that improve the absorption of fat-soluble vitamins and pigments in poultry.

(1)Experimental animals: Eighty-four AA+broilers

Experimental design:

Broilers were randomly assigned to 3 treatments with 2 replicates of 14 chicks each

Determination index: Contents of fat-soluble vitamins A,D,E and K in liver and serum of broilers

Index	Parts	Control group	Bile acid,mg/kg	
			200	400
Vit A (nmol/L)	Liver	9387.25 ± 128.86 ^b	9537.32 ± 133.88 ^b	11525.43 ± 146.69 ^a
	Serum	1010.21 ± 36.19 ^b	1122.28 ± 38.45 ^b	1292.23 ± 78.59 ^a
VitD (ng/mL)	Liver	216.00 ± 8.36 ^b	223.65 ± 5.91 ^b	260.60 ± 5.37 ^a
	Serum	22.09 ± 0.92 ^b	27.64 ± 0.73 ^b	31.30 ± 2.38 ^a
VitE (umol/L)	Liver	415.29 ± 6.81 ^b	415.43 ± 8.32 ^b	449.83 ± 6.31 ^a
	Serum	52.97 ± 1.76 ^b	57.15 ± 2.05 ^b	66.23 ± 2.47 ^a
VitK (nmol/L)	Liver	119.56 ± 2.76 ^b	115.29 ± 2.38 ^b	134.23 ± 2.82 ^a
	Serum	13.32 ± 0.32 ^b	14.42 ± 0.55 ^b	17.35 ± 0.98 ^a

Conclusion: Adding bile acid to broiler diet can significantly promote the absorption of fat-soluble vitamins and increase the deposition of fat-soluble vitamins in liver.

(2)Bile acids enhance pigments absorption

Comparison the chicken foot pigment



Control-H10 -colour fan 6



bile acid-H11colour fan 7



Control-H10-Age: 66 day (live 1.9 kg) Carcass -1.48kg



bile acid-H11Age: 66 day live 1.9kg) Carcass -1.48kg

From the picture,we can see that bile acids improve the absorption of pigment in broilers.