

BioCholine

Natural & highly bio-available esterified choline

Regulates energy metabolism
and help to prevent fatty liver syndrome



- Non-hygroscopic
- No adverse effect vitamins in feed



Regulation of Energy Metabolism with **BioCholine** :

BioCholine is a unique natural animal feed supplement that contains natural, stable and highly bioavailable choline in conjugated / esterified form (phosphatidyl choline, lecithins and equivalents) along with other phospholipids and essential fatty acids. Esterification confers receptor recognition and higher bioavailability.

BioCholine also contains phosphatidyl inositol, known as a part of lecithin group. Without both inositol and choline, the two important dietary emulsifiers, the dietary fats and bile become trapped in the liver, causing FLS, cirrhosis and blockage in fat metabolism. Therefore, availability of both these components in **BioCholine** working together in synergy, helps efficient emulsification of dietary fat and fat soluble vitamins (A, D, E and K) for their optimum utilization.

Besides Phosphatidyl Choline, **BioCholine** also contains other phospholipids and phytoactive conjugates that bind with nuclear PPAR- α receptors in the liver and activate them. This leads to signal transduction and subsequent release of the hormone Adiponectin which is involved in lipid mobilization, reduced free fatty acid uptake in liver and lipolysis for efficient energy metabolism. Since the entire action is nuclear receptor mediated, small quantity of phosphatidyl choline and allied phospholipid compounds are sufficient to initiate this process for energy metabolism.

It is most interesting that the phytoactives of the natural supplement contained in **BioCholine** also help to improve the integrity of hepatocytes, optimize liver function and enhance the synthesis and bio-availability of bile for optimum absorption and utilization of fats. **BioCholine** also contains biotin like bioactives, which act in concert, to produce the desired benefits with **BioCholine**.

Comparative Advantages of **BioCholine** v/s Choline chloride

Choline chloride	BioCholine
Poorly absorbed from GI tract due to inorganic form hence less bio-available	Efficiently absorbed due to organic conjugated form
Nearly 2/3rd of choline is lost due to its conversion into trimethylamine (TMA) by intestinal bacteria which is toxic and confers fishy taint	Negligible quantity of choline gets converted into TMA from esterified choline of BioCholine
Hygroscopic - enhances oxidative destruction of vitamins, minerals and pigments	Non-hygroscopic - safe for vitamins, minerals and pigments
Corrosive - causes damage to premix/feed mill equipments	Non-corrosive - safe for premix/feed mill equipments
Makes the premix darker, clumpy and impairs mixability	Does not cause discolouration, premix remains free flowing and clump free. Mixability is not at all impaired
Many intermediate steps are involved before it can act	Direct action - no intermediate steps
Low peak levels achieved and they persist for short duration in biological system	Higher (3 times) peak levels are achieved and they persist for 3 times longer duration
No role as emulsifier	Both phosphatidyl-choline and phosphatidyl-inositol in BioCholine work together in synergy as efficient emulsifier
High feed inclusion cost and high logistic cost	Lower inclusion rate and less cost - better margin for premix/feed manufacturer and lower transport and storage cost
No role in recycling of methionine in the energy cycle	Phosphatidyl-choline present in BioCholine helps regeneration of methionine from homocysteine for recycling of dietary and supplemental methionine in the energy cycle

‘Pictures Are Worth A Thousand Words’

Jason Flint, Nutreco, Trouw Nutrition GB, UK



Choline chloride



BioCholine



Choline chloride



BioCholine

- ▶ Choline chloride made the Premix darker and it started to clump.
- ▶ With **BioCholine** there was no discolouration, mix remained free flowing and clump free. Mixability was not at all impaired.

BioCholine is backed by strong scientific research database:

The efficacy and safety of BioCholine has been proven and established through a number of multicentre clinical trials carried out by eminent scientists and investigators at premier national & foreign research institutes and universities. Product benefits are scientifically validated through more than 50 research publications in national and foreign journals of high impact factor. Two scientists have done MVSc. thesis on BioCholine. Research work on BioCholine has been carried out in top universities in more than 12 countries worldwide. BioCholine has been studied for all important parameters such as growth & performance in broiler, egg production & egg qualitative parameters in layer, abdominal fat and liver lipid, carcass traits, production efficiency index, liver marker parameters, immuno-biochemical parameters, graded dose rate studies in different trials conducted in France (5) Poland (4) Belgium (2) Taiwan (2) Brazil (5) Philippines (1) Mexico (10) UK (1) Canada (1) Serbia (2) Thailand (1) USA (1) & INDIA (28).

BioCholine significantly reduces abdominal and liver fat % than choline deficient and choline chloride supplemented groups

Effect Of BioCholine Supplementation On Abdominal Fat, Dressing % And Liver Lipid Conc.			
Parameters	Abdominal Fat %	Dressing %	Liver Lipid (mg/g)
Ration without Choline	1.90 ±0.09	72.01 ± 0.8	49.37 ± 2.94
Ration with Choline Chloride 60% (@1kg/ton of feed)	1.96±0.08	70.93 ±0.86	41 ±2.73
Ration with BioCholine (@ 500g/ton of feed)	1.62±0.10	71.17 ±0.85	35.12 ± 1.95

The biological evaluation of BioCholine as a substitute to choline chloride on performance of commercial broilers. G. Devegowda et al, Dept. of Poultry Sci., Uni. Of Agricultural Sci., Bangalore Livestock International., July-Sept, 2011:12-14

Scientific Validation o Effect of supplementation of BioCholine

Effect of supplementation of BioCholine on performance of Cobb 400 broiler birds

Supplement	Feed Intake (g)	Body wt (g)	FCR	Mortality (%)
Choline Chloride (60%)	3623	2233	1.62	4.7
BioCholine	3599	2262	1.59	4.0

Field trial conducted by Dr. Ravinder Reddy in Hyderabad.

Effect of supplementation of BioCholine on performance of commercial broiler birds

Supplement	Feed Intake (g)	Body wt (g)	FCR	EIP*
Choline Chloride (60%)	3524.6	2222.2	1.61	298.39
BioCholine	3826.2	2397.4	1.62	314.39

*European Index of Production = {Avg daily wt gain (g) X Survival (%) / (FCR X 10)}
Prof. Ricardo Vianna Nunes; University of Marechal, Candido Rondon, Brazil.

Effect of supplementation of BioCholine on performance of commercial broiler birds

Supplement	Body wt (g)	C- FCR	Mortality	EIP*
Choline Chloride (60%)	2547	1.71	4.07	339.8
BioCholine	2665	1.58	3.50	389.1

*European Index of Production = {Avg daily wt gain (g) X Survival (%) / (FCR X 10)}
Field trial in Brazil

BioCholine
helps significant
cost reduction and therefore
improves profitability.

Usage of **BioCholine** :

- Ensures efficient energy metabolism and prevention of fatty liver syndrome
 - Improves integrity of hepatocytes and optimizes liver function
 - Helps to optimise lipid and carbohydrate metabolism, improves glucose/energy utilization and reduces carcass fat content
 - Maintains secretion of bile at optimum levels and helps prevent liver enlargement, fatty infiltration/fatty liver condition
 - Maintains growth, FCR, egg production, livability and hatchability at optimum levels
- Cholinomimetic bioactivity helps maintain brain and nerve cell nutrition

Feed Inclusion Rate of **BioCholine** :

750gm **BioCholine** can replace 1 kg of choline chloride (60%) with better production performance and prevention of FLS.

Presentation of **BioCholine** :

10 kg & 25 kg



Indian Herbs becomes the first company ever to
establish the mode of action of a herbal product
by conducting gene expression study
at
Department of Poultry Science



**UNIVERSITY OF
GEORGIA**

Athens, USA

BioCholine regulates gene
expression of key allosteric effector enzymes
of lipid and glucose metabolism in liver

Marketed by

AVON
animal health

Uttara Dhaka 1230 Bangladesh

Manufactured by



INDIAN HERBS SPECIALITIES Pvt. Ltd.

Chandigarh, India