

Lysophosphatidylcholine as digestion enhancer in monogastics

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The digestion and absorption of dietary fats require a processing of water-insoluble triglycerides into a water medium. In the gastro-intestinal tract they are emulsified by the detergent action of the bile and hydrolyzed by lipases. Phospholipids are the major components responsible for the emulsion. Normal phospholipid molecules have both lipophilic and hydrophilic parts due to two fatty acids esterified to glycerol, and a phosphoric acid and either choline, ethanolamine or inositol. Such a combination allow them to act as biosurfactants when mixed with water and fats.

Lysophosphatidylcholine (Lysoforte), a specific phospholipid, naturally existing, is even more hydrophilic than the other phospholipids as it has only one fatty acid residue per molecule, which makes it a very effective biosurfactant for oil-in-water emulsions (Mine *et al.* 1992). Lysoforte can change the conformation of the ovalbumin protein from eggs by reducing the average droplet size and substantially enhancing the absorption of linoleic acid from the intestines (Saunders and Sillery, 1976).

A number of animal trials have been carried out to evaluate the efficacy of lysoforte in enhancing animal digestion as well as performance. Table 1 shows the results of an industrial scale broiler trial conducted in Spain. Improvements were obtained in growth, FCR and livability. A recent trial with layers showed a clear increase in egg size and egg mass production (Kemin Industries, unpublished results).

A digestibility trial with pigs conducted in Australia showed an overall enhancement in digestibility (Table 2), particularly that in amino acids.

Table 1 The effect of Lysoforte addition (500 g/T) on broiler performance (O-47 d, Spain, 1993).

	Control	Lysoforte
Starting No.	7600	4900
Number at end	7300	4750
Final weight (kg)	1.98	2.16
FCR	2.14	2.02
Mortality (%)	3.95	3.06

Significant improvements in growth performance were observed in a number of studies with piglets following lysoforte supplementation (Schwarzer and Adams, 1996). Growing-finishing pig trials conducted in several countries also indicated better growth, FCR and carcass dressing percentage in pigs fed diets containing lysoforte than those fed control diets.

References

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Table 2 The effect of Lysoforte (750g/t) on ileal digestibility in growing pigs fed barley based diets (van Bameveld, unpublished data).

	Control (%)	Lysoforte (%)	Significance
DM	0.55	0.65	NS
Protein	0.70	0.80	*
Gross Energy	0.65	0.73	NS
Fat	0.48	0.56	NS
Arginine	0.83	0.88	*
Histidine	0.74	0.83	*
Isoleucine	0.69	0.78	*
Leucine	0.74	0.82	*
Lysine	0.75	0.83	*
Phenylalanine	0.75	0.83	*
Threonine	0.66	0.69	NS
Valine	0.70	0.80	*