

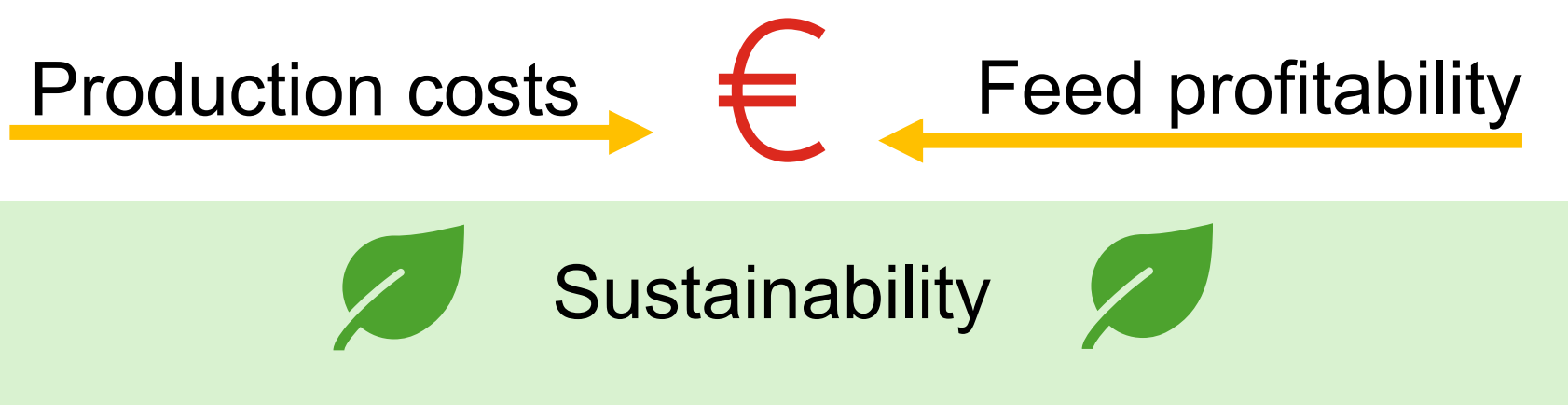
ADVANCING SUSTAINABLE BROILER PRODUCTION

THE VALUE OF A LYSOLECITHIN BASED NUTRIENT ABSORPTION ENHANCER

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Introduction



With high production costs and growing concerns on sustainability, the poultry industry is seeking for solutions that both improve feed profitability and sustainability. This study examined the effect of adding a liquid or dry blend of lysolecithin, synthetic emulsifier, and monoglycerides (LYSOFORTE® EXTEND, LEX) in a broiler diet with two energy densities, on growth performance, profitability and environmental impact.

Materials & Methods

Location - Roslin Nutrition (Scotland)

1248 one-day-old males Ross 308 broilers were randomly assigned to 6 dietary treatments for 42 days, each with 13 pens of 16 birds.

	No supplement	LEX Dry	LEX Liquid
Normal Energy	-	500 g/ton	300 g/ton
Low Energy	-	500 g/ton	300 g/ton

-90kcal in starter
-100kcal in grower & finisher

3-phase feeding system:

- starter (1-10d),
- grower (11-21d)
- finisher (22-42d).

Nutrient values of the diets were calculated according to the CVB 2018 values of feedstuffs. Feed formulation is presented in Table 1.

Feed intake (FI) and weight were measured on day 0, 10, 21 and 42, on day 42 a litter sample was collected from each pen (mixed from 5 sites within the pen) and two birds per pen were assessed for footpad lesions.

Measured parameters

- Pens were the experimental unit, and P<0.05 was considered significant. All data were calculated using the analysis of variance of the general linear model procedure under the SAS.
- To assess the profitability, a calculation of the IOFC for each treatment was performed. It involved performance data, feed cost per feeding phase, and price per kg of live weight at farm gate.

Table 1. Ingredient and nutrient composition of the experimental diets

Ingredients	Starter		Grower		Finisher	
	NE	LE	NE	LE	NE	LE
Corn	46,88	45,70	48,73	49,31	51,81	52,31
Wheat	10,00	10,00	10,00	10,00	10,00	10,00
Rapeseed M 35% CP	-	3,50	-	4,23	-	4,33
Soybean M 47% CP	35,27	35,21	32,49	31,05	30,43	28,63
Full-fat Soya 35% CP	1,50	-	2,40	-	2,00	-
Soya oil	2,40	1,80	3,00	2,10	3,14	2,20
MCP	0,92	0,88	0,68	0,65	0,45	0,42
Sodium bicarb.	0,30	0,28	0,18	0,19	0,10	0,10
Limestone	1,19	1,17	1,18	1,13	0,90	0,85
Sodium chloride	0,27	0,27	0,30	0,29	0,30	0,30
DL-Methionine	0,333	0,30	0,290	0,271	0,227	0,207
L-Lysine HCl	0,233	0,208	0,144	0,166	0,084	0,106
L-Threonine	0,116	0,097	0,082	0,083	0,040	0,040
L-Valine	0,076	0,054	0,019	0,021	-	-
Phytase 5000	0,010	0,010	0,010	0,010	0,010	0,010
Vit-Min premix*	0,500	0,500	0,500	0,500	0,500	0,500

Nutrients	Starter		Grower		Finisher	
	NE	LE	NE	LE	NE	LE
AME (kcal/kg)	2885	2795	2960	2860	3010	2910
Crude protein (%)	22,50	22,50	21,00	21,00	20,00	20,00
Fat (%)	5,06	4,25	5,85	4,64	6,00	4,81
Crude fiber (%)	3,20	5,63	3,14	3,45	3,06	3,38
Dig. Lysine (%)	1,22	1,22	1,10	1,10	1,00	1,00
Dig. Met (%)	0,63	0,61	0,57	0,56	0,50	0,49
Dig. Met + Cys (%)	0,90	0,90	0,84	0,84	0,76	0,76
Dig. Thr (%)	0,79	0,79	0,73	0,73	0,66	0,66
Dig. Ile (%)	0,82	0,83	0,78	0,77	0,75	0,73
Dig. Val (%)	0,96	0,96	0,87	0,87	0,82	0,81
Dig. Arg (%)	1,34	1,36	1,28	1,25	1,21	1,19
Dig. Trp (%)	0,23	0,24	0,22	0,22	0,21	0,21
Calcium (%)	0,95	0,96	0,90	0,90	0,75	0,75
Total P (%)	0,58	0,60	0,52	0,54	0,46	0,48
Dig. P (%)	0,45	0,45	0,40	0,40	0,35	0,35
Sodium (%)	0,19	0,19	0,17	0,17	0,15	0,15

Results

	Normal Energy			Low Energy		
	Control	LEX DRY	LEX LIQUID	Control	LEX DRY	LEX LIQUID
BWG day 0-42	2718	2829	2895	2722	2787*	2893
FI day 0-42	4479	4545	4611	4584*	4636*	4783
FCR* day 0-42	1.649	1.607	1.595	1.698*	1.664*	1.656

The carbon footprint (CFP) and land use change (LUC) per kg life weight (LW) was calculated according to LCA values of feed ingredients. LEX dry and liquid supplementation to NE diets reduced CFP respectively by 0.11 up to 0.15 kg CO₂ eq/kg LW and LUC respectively by 13.1 up to 17.5 Pt/kg LW compared to NE control. Supplementing LEX dry and liquid to LE diets respectively reduced CFP by 0.29 and 0.21 kg CO₂ eq/kg LW and LUC respectively by 16.7 up to 19.8 Pt/kg LW compared to NE control.

LEX significantly (P=0.0331) increased body weight gain across the study compared to the controls with improvements between 2.4% and 6.5%. Energy level had no significant effect on BWG (P=0.8021), nor the interaction between energy level and LEX supplementation (P=0.9242). Lowering energy levels impaired (P=0.0027) feed conversion ratio (FCR) and LEX supplementation improved it (P=0.0747) compared to non-supplemented control with 3.3% improvements in NE diets and up to 1.8% in LE diets.

	Normal Energy			Low Energy		
	Control	LEX DRY	LEX Liquid	Control	LEX DRY	LEX Liquid
kg CO ₂ eq/kg LW	4,37	4,26	4,22	4,13	4,08	4,05
Δ in kg CO ₂ /kg LW		-0,11	-0,14	-0,24	-0,29	-0,31
Land use (Pt / kg LW)	527,6	514,6	510,1	517,4	510,9	507,8
Δ in Land use in pt/kg LW		-13,1	-17,5	-10,2	-16,7	-19,8
Water use (m ³ depriv. / kg LW)	0,096	0,096	0,095	0,096	0,096	0,096
Δ m ³ /kg LW		-0,0004	-0,001	-0,0003	0,0005	0,0005

Conclusion

LYSOFORTE EXTEND supplementation enhanced growth performance and profitability, while promoting a lower CFP and LUC of broiler production.

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