

Dietary supplementation of lysolecithin compared to a combination of lysolecithin, synthetic emulsifier and monoglycerides, on laying performance and egg quality of laying hens

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Introduction

The positive effect of lysolecithin supplementation to broiler diets on growth performance, energy availability, lipid and protein digestibility has been previously documented. The addition of monoglycerides and synthetic emulsifiers in combination with lysolecithins, could further improve digestion and absorption of nutrients of poultry diets. The present study investigates the efficacy of supplementing lysolecithin alone compared to a combination of lysolecithin, synthetic emulsifier and monoglycerides to diets of laying hens on laying performance and selected egg quality parameters.

Experimental design and diets

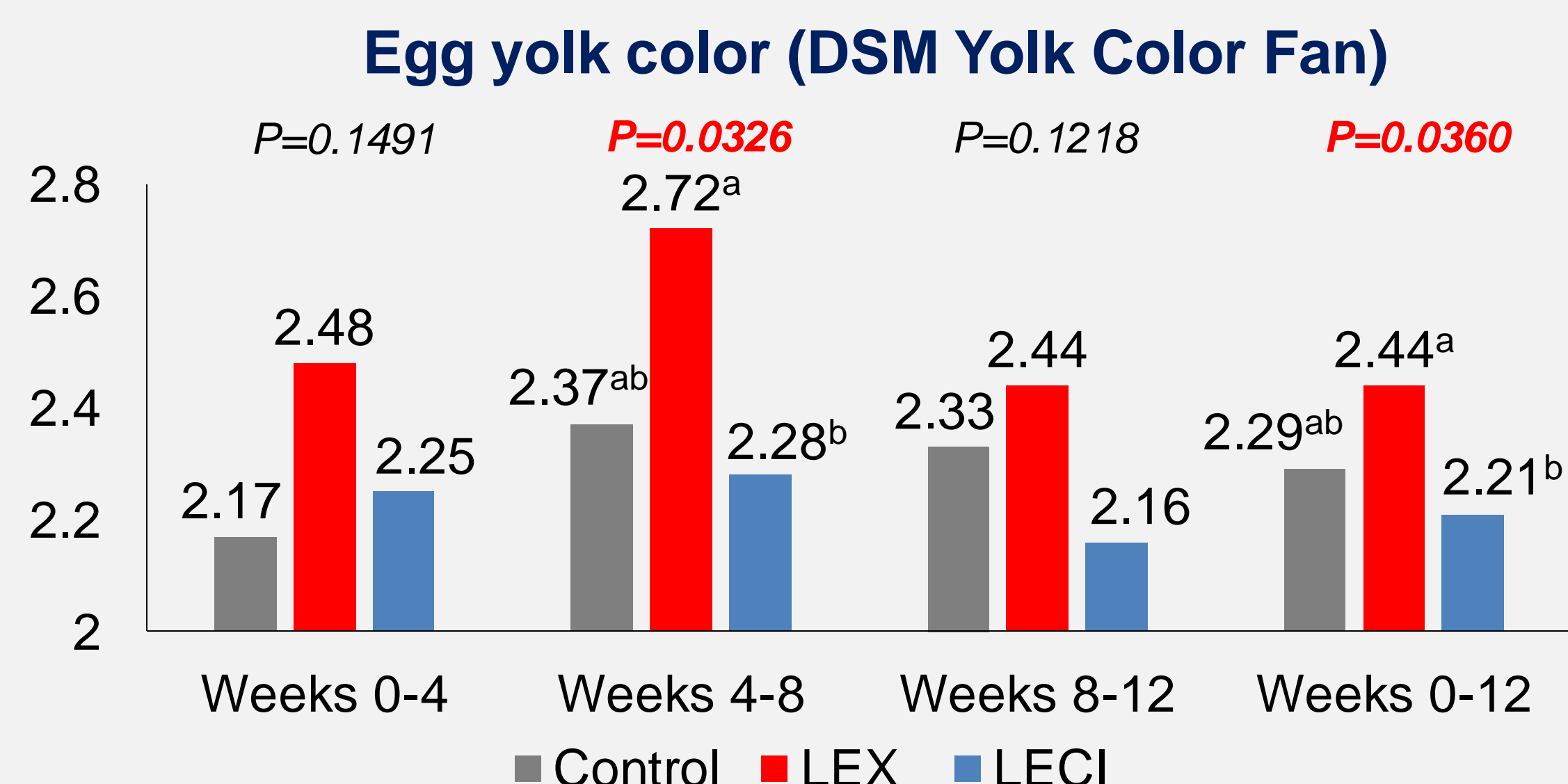
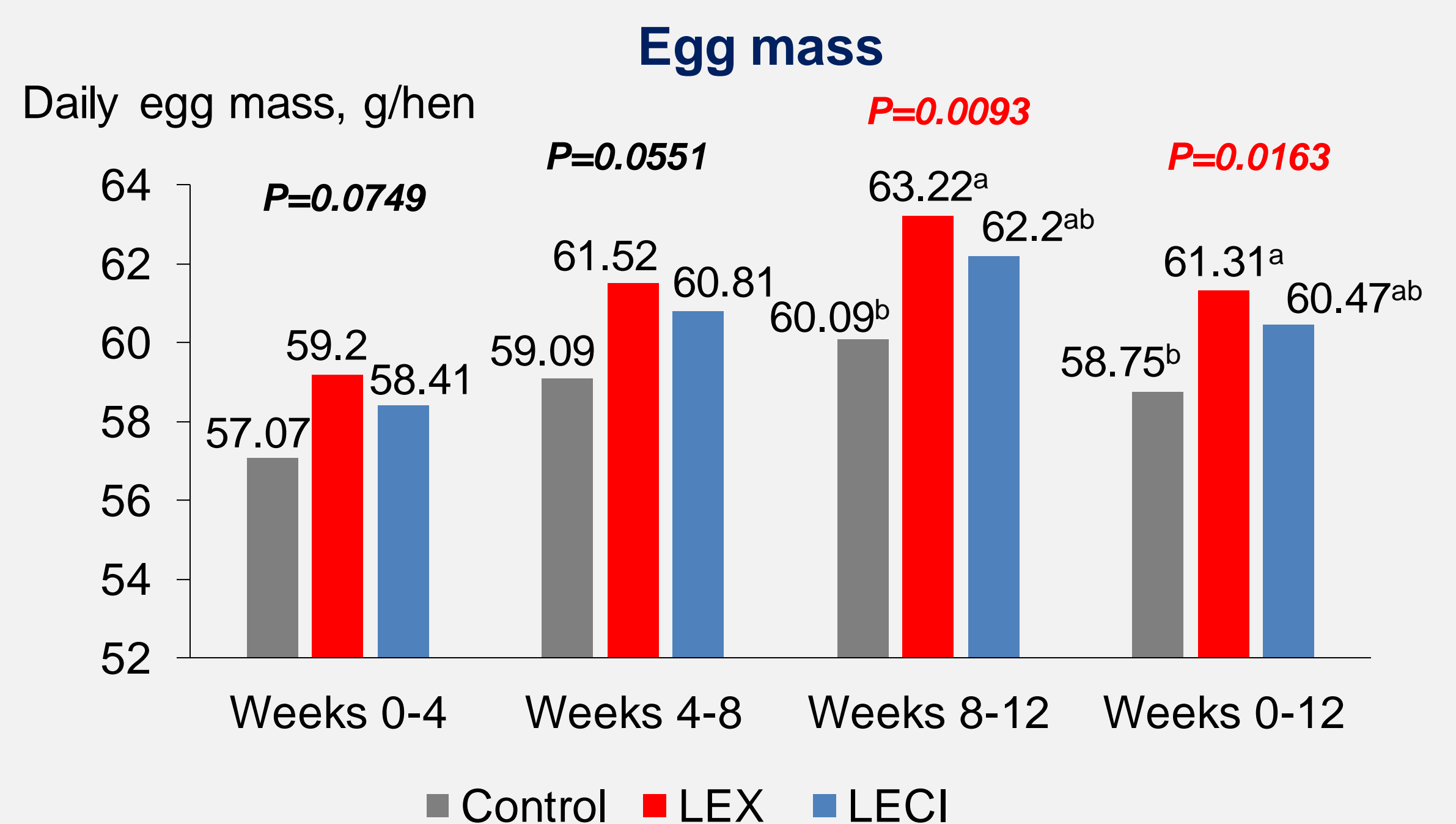
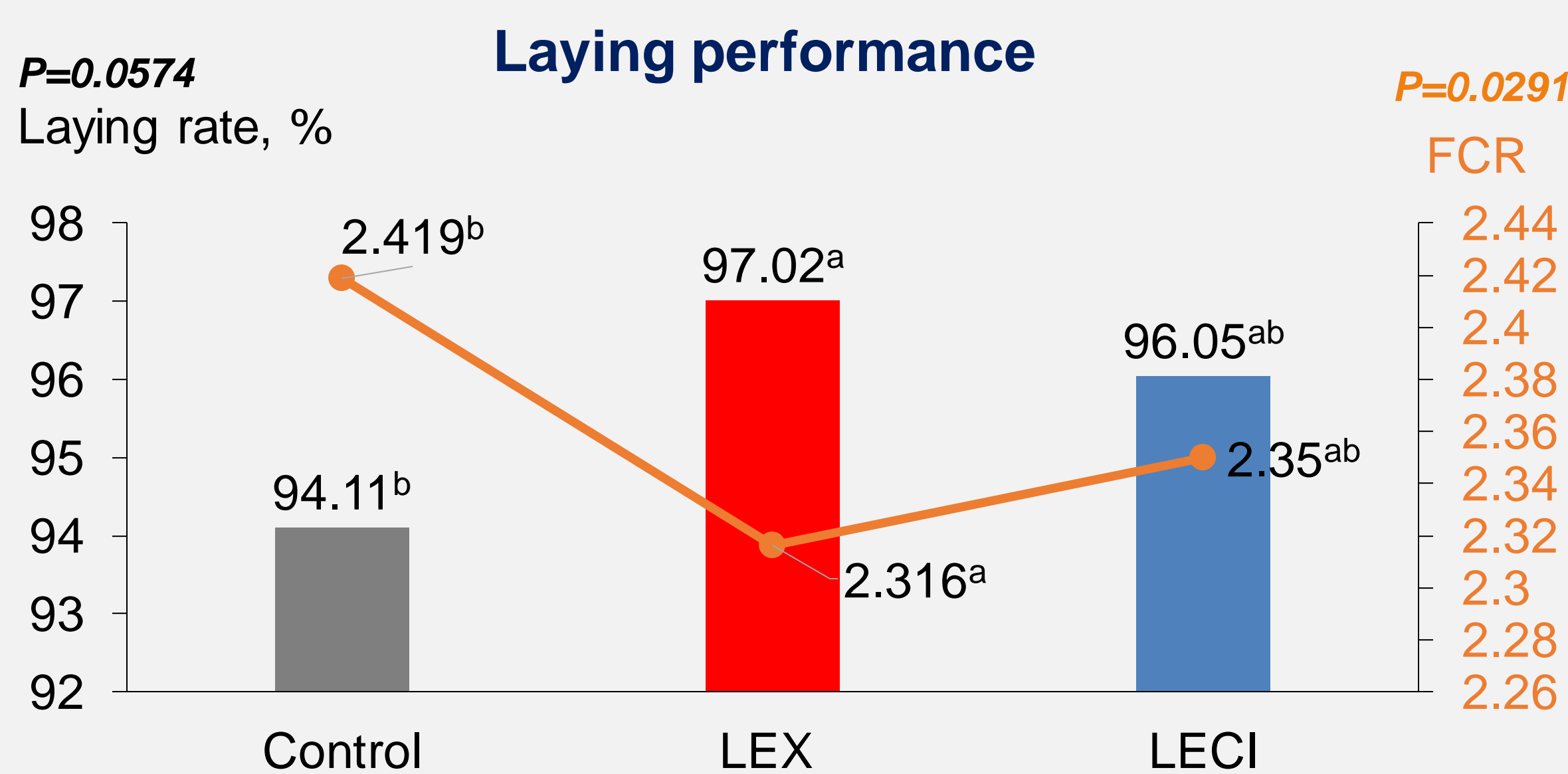
- Location: Roslin Nutrition (Scotland)
- 16-week-old 384 Hy-line brown laying hens on arrival at the trial facility. The study started when laying hens were 22 weeks old and lasted during the next 12 weeks
- 3 treatments (32 cages of 4 laying hens per treatment):
 1. Control: standard wheat-maize-soybean diet.
 2. LECI: control + 500 ppm of lysolecithins
 3. LEX: control + 500 ppm of a combination of lysolecithins, a synthetic emulsifier and monoglycerides
- **Measured parameters:**
 - Bird weight at the start and end of the trial.
 - Daily egg number, weight, and condition (cracked, dirty, soft shells).
 - Weekly egg mass and feed intake.
 - Every 4 weeks throughout the study, 1 egg per pen (in total 96 eggs per treatment) was assessed, using an EggAnalyzer, for egg weight, yolk color (DSM Yolk Color Fan), albumin height and Haugh unit.

Ingredient and nutrient composition of the control diet

Ingredient	Inclusion (%)	Calculated Analysis	Inclusion (%)
Wheat	41.5100	ME Poultry (MJ/kg)	11.679
High-pro Soybean meal	17.5000	ME Poultry (kcal/kg)	2790
Maize	30.0000	Crude Protein (%)	15.030
Soya Oil	1.5000	Crude Fat (%)	3.528
Sodium Bicarbonate	0.2000	Crude Fibre (%)	2.480
Monocalcium Phosphate	1.0600	Ash (%)	9.962
Limestone	7.0000	Calcium (%)	3.062
Salt	0.2700	Total Phosphorus (%)	0.544
L-lysine	0.0025	Sodium (%)	0.180
DL-Methionine	0.1730	Methionine (%)	0.401
L-Threonine	0.0295	Lysine (%)	0.603
DL-tryptophan	0.0011	M+C (%)	0.616
Choline Chloride	0.2400		
Vitamin E 50%	0.0100		
Vitamin-Mineral Premix	0.5000		

Data was subjected to ANOVA using suites of GLMM Platforms in JMP 14.0 or SAS 9.4 (SAS Institute Inc., Cary, NC). Treatment was considered as the main effect and replicate cage as a random effect in the model. When ANOVA was significant ($P \leq 0.05$), to separate differences between means Tukey's honest significant difference test was used.

Results



Conclusion

- Adding a combination of lysolecithin, monoglycerides and synthetic emulsifier (LEX) to a control diet improved FCR and daily egg mass and tended to improve laying rate compared to lysolecithin alone (LECI).
- Egg yolk color in LEX-fed hens increased compared to that of the LECI hens
- Dietary supplementation of LECI did not influence ($p > 0.05$) any of the evaluated parameters compared to control.