

Impact of AO-Biotics® EQE on Egg Production and Egg Quality Traits of Laying Hens from 42 to 53 Weeks of Age.

Study in collaboration with CIAAY Centro de Investigación
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- AO-Biotics® EQE improved egg production and egg mass
- AO-Biotics® EQE improved the eggshell resistance and kilograms of sellable eggs
- AO-Biotics® EQE improved the ROI

SUMMARY

DOSE OF AO-BIOTICS® USED
50 g/metric ton of feed

Supplementation with **AO-Biotics® EQE** improved the productivity and the egg quality traits in the hens under test. This resulted in an increment in the number of sellable eggs, resulting in an economic advantage.

VALUE

The inclusion of **AO-Biotics® EQE** in the nutritional program for laying hens contributes to increasing egg mass, the productivity of the flock, and the quality of the eggs laid.

PROTOCOL

Location:

- Yucatán, Mexico (Southeast Mexico)

Duration:

- The impact of **AO-Biotics® EQE** was evaluated for 11 weeks, beginning the evaluation at week 42 of age.

Animals:

- Approximately 576 laying hens were distributed in 144 cages (4 hens per cage)
- Bovans

Treatments:

- Control group without **AO-Biotics® EQE**
- Treatment group with the same diet as Control but supplemented with **AO-Biotics® EQE** at 50 g/ton of feed.

Trial Design:

- Completely randomized design with 2 treatments
- 144 replicates (72 replicates/treatment) were used.
 - Each replicate was represented by 1 cage with 4 hens per cage, distributed in two two-level pyramids with 4 rows of 18 cages per row and 72 cages per pyramid.
 - Laying hens were randomly assigned to their cages and the cages were randomly assigned to the treatments.
- Laying hens were fed the same diet. Half of the cages (replicates) randomly assigned received the control diet (72 replicates), whereas the other cages received the control diet supplemented with 50 g of **AO-Biotics® EQE**/metric ton of feed (72 replicates).

PROTOCOL (CONTINUED)

Data Collection:

Hen production:

- Laying rate
- Egg weight and egg mass
- Feed intake
- Feed conversion rate

Egg quality:

- Percentage of discarded eggs
- Percentage of sellable eggs
- Egg compositions (egg yolk color, and Haugh units)
- Eggshell resistance

RESULTS

AO-Biotics® EQE improved egg production (Table 1; Figure 1).

- A significant interaction treatment × week was observed, showing an increment in egg production by 2% from 43 to 45 weeks of age (97.0% vs 94.7% egg production for the EQE and the control group, respectively; $P \geq 0.028$).
- In general, **AO-Biotics® EQE** improved egg production by 1% in hens from 42 to 53 weeks of age.

AO-Biotics® EQE improved egg mass by 1% (Table 1).

AO-Biotics® EQE improved eggshell resistance by 3% ($P = 0,028$) (Figure 2).

AO-Biotics® EQE increased sellable eggs by 1% (more kg of eggs sold; Figure 3).

Improvements observed with the inclusion of **AO-Biotics® EQE** resulted in an increment of the ROI (4:1; Table 2)

Table 1. Mean performance and egg quality of hens fed control or AO-Biotics® EQE treated diet from 42 to 53 weeks of age.

42 – 53 weeks of age	Control	EQE ²	SEM ¹	P-value	
				TTO	TTO*Week of age
Hen Performance					
Egg production, %	95.7	96.3	0.340	0.21	<0.001
Daily feed intake, g/d	102	103	0.272	0.007	<0.001
Egg mass, g	55.6	55.9	0.257	0.34	<0.001
Feed conversion ratio, g:g	1.84	1.85	0.008	0.57	0.004
Egg Traits					
Egg weight, g	58.0	58.1	0.179	0.95	<0.001
Discarded eggs, %	7.27	7.32	0.357	0.92	<0.001
Sellable eggs, %	92.7	92.7	0.357	0.92	<0.001
Eggshell resistance, kg/cm ²	4.69	4.82	0.044	0.028	-
Egg yolk color	8.83	9.17	0.069	<0.001	<0.001
Haugh units	88.6	88.4	0.401	0.70	<0.001
Sellable Eggs					
Eggs per hen per week, n	6.21	6.25	0.035	0.45	<0.001
Cumulative eggs per hen, n	74.6	75.0	-	-	-
Cumulative kg of eggs per hen, kg	4,326.80	4,357.50	-	-	-

¹ Standard error of the mean.

² Control diet supplemented with **AO-Biotics® EQE** at 50 g/metric ton.

RESULTS (CONTINUED)

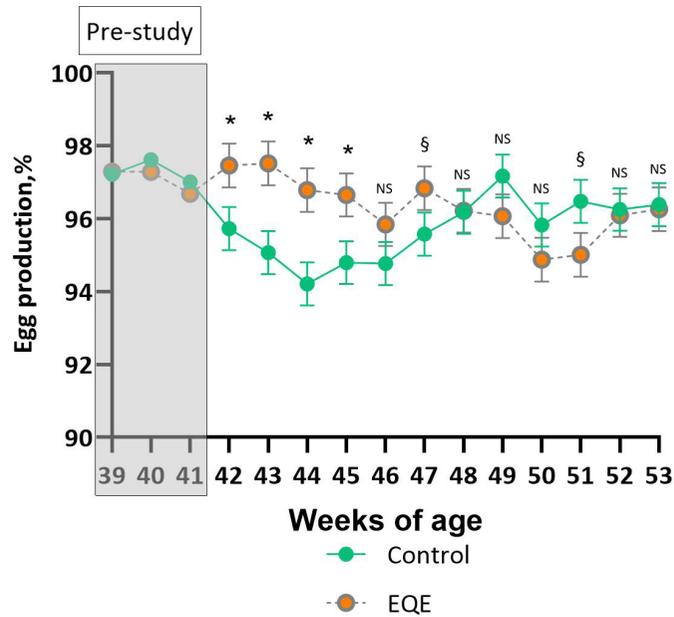


Figure 1. Impact of AO-Biotics® EQE at 50 g/ton of feed on the laying rate of hens from 42 to 53 weeks of age.

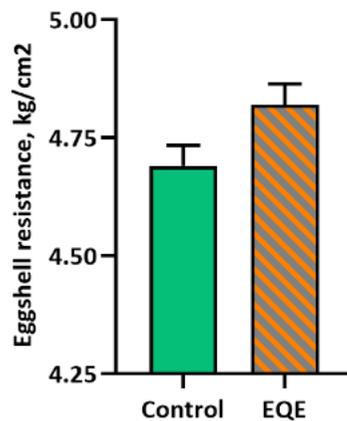


Figure 2. Impact of AO-Biotics® EQE at 50 g/ton of feed on the eggshell resistance in hens from 42 to 53 weeks of age.

RESULTS (CONTINUED)

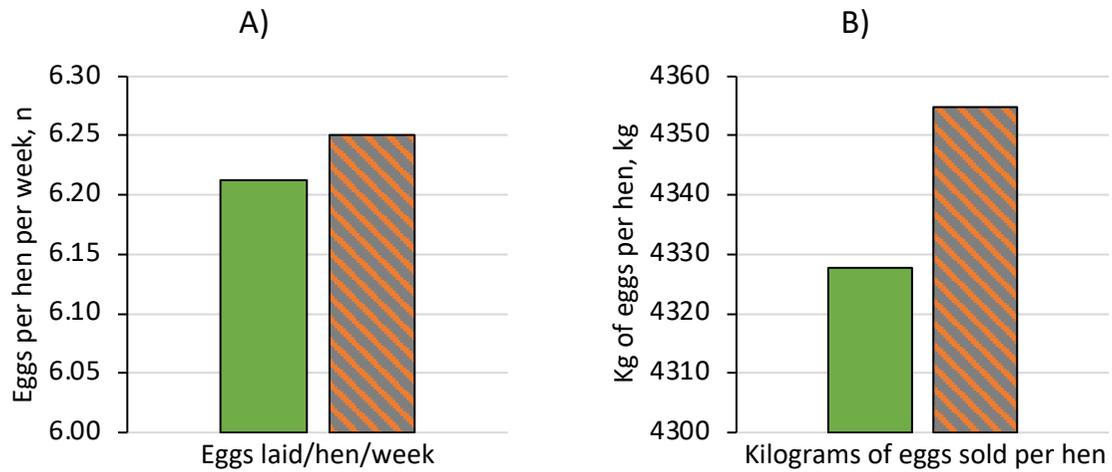


Figure 3. Impact of AO-Biotics® EQE at 50 g/ton of feed on the sellable eggs in hens from 42 to 53 weeks of age.

- A) Number of eggs laid per hen per week.
- B) Kilograms sold per hen in 12 weeks of production.

RESULTS (CONTINUED)

Table 2. An economic evaluation of the ROI when including AO-Biotics® EQE in the diet of hens from 42 to 53 weeks of age.¹

Mexican Values in Mexican Pesos	Values to Enter	
Number of laying hens in the operation, n of laying hens	20000	
Pullet price, \$	\$100.00	
Weeks of age of pullets when entering into production, week of age	42	
Total weeks of age at the end of the laying cycle, weeks of age	53	
Mortality of the flock, %	0.00%	
Feed price, \$/MT	\$8,000.00	
Inclusion price of EQE (price to end user), \$/50 g of EQE	\$35.00	
ADFI, kg/d	0.103	
Rate of production, average %	95.7%	
Number of eggs laid per hen on production cycle, n of eggs	74.6	
Average egg weight, g	58.0	
Egg price, \$/kg	\$26.00	
Economical Evaluation Assuming 20 Thousand Hens	Control	AO-Biotics® EQE
A- Income from total sold eggs on the production cycle, \$	-	-
B- Income from kg of sold eggs on the production cycle, \$	\$2,248,428.00	\$2,270,912.28
Investment costs, \$		
C- Pullet price, \$	\$2,000,000.00	\$2,000,000.00
D- Feed, \$	\$1,265,264.00	\$1,270,799.53
E- Cost due to mortality (pullet price), \$	-	-
F- Total investment cost, \$	\$3,265,264.00	\$3,270,799.53
EQE Economical Evaluation		
Recommended dose of EQE, g/MT of feed	50	
Inclusion price of EQE (price to end user), \$/50 g of EQE	\$35.00	
EQE Cost in production		
EQE per production cycle, kg need	7.91	
Inclusion cost of EQE per production cycle, \$	\$5,535.53	
EQE Marginal income kg of sold eggs on the production cycle, \$	\$22,484.28	
EQE Marginal cost, \$ (difference in F)	\$5,535.53	
EQE Return, kg of eggs sold, \$	\$16,948.75	
EQE Investment, \$	\$5,535.53	
EQE ROI (kg of eggs sold)	4	

¹ Evaluation was done utilizing BioZyme's Economic Return Calculator and local market values (Mexico in Mexican Pesos).

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