

# Essential oil blend as a possible alternative to antibiotic growth promoters in broiler production

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## INTRODUCTION

- Despite the limited use of antibiotics as growth promoters (AGPs) in a number of countries, many other regions find a useful tool in them. However, an increasing number of producers in the later areas are transitioning to AGP-free production for commercial reasons

### OBJECTIVE OF THE TRIAL

- The aim of this trial was to determine whether a blend of essential oils (EO), like oregano or clove, could reach similar production/health parameters compared to an AGP treatment used in broiler production in Indonesia

## MATERIAL AND METHODS

### HOUSING:

- Broiler barn located in the Faculty of Animal Science UGM, Sleman, Yogyakarta

### ANIMALS AND DISTRIBUTION:

- 1,200 one-day-old New Lohmann chicks
- Distributed in 2 treatments within 12 floor pens (n=6)



### TREATMENTS:

- T1: basal feed + Antibiotic (Enramycin 10 ppm)
- T2: basal feed + Essential oils (1 kg/t)



### DURATION OF THE TRIAL:

- The trial lasted 35d

### PARAMETERS RECORDED:

- Performance parameters were recorded weekly
- On day 21 and 35, one bird per pen was euthanized for intestinal and carcass analysis:

- Total and relative intestinal weight and length
- Carcass/organ weights and carcass yield

### STATISTICAL ANALYSIS:

- Data were analyzed by one-way ANOVA using the GLM procedure of SAS 9.0

## RESULTS

### PERFORMANCE PARAMETERS

- There were no significant differences in the performance parameters at 35d
- A trend was observed of higher body weight at 28d for EO birds compared to AGP birds
- It relates to another trend of increased daily gain from 21-28d where a higher weekly weight gain was observed in animals from EO treatment

PARAMETERS	PERFORMANCE PARAMETERS FROM 0 TO 28/35d								
	BW (g)		WEEKLY GAIN (g)		ADG (g)	FEED INTAKE (g)		FCR (g/g)	
	0-28d	0-35d	4 <sup>th</sup> (21-28d)	5 <sup>th</sup> (28-35d)	0-35d	0-28d	0-35d	0-28d	0-35d
ANTIBIOTIC	1,671 <sup>y</sup>	2,155	653 <sup>y</sup>	484	60.32	2,090	3,133	1.26	1.46
ESSENTIAL OILS	1,708 <sup>x</sup>	2,185	685 <sup>x</sup>	496	61.61	2,161	3,233	1.27	1.49
SEM	12.359	32.984	13.252	19.347	0.942	45.100	51.168	0.029	0.030
P value	<b>0.062</b>	0.682	<b>0.071</b>	0.678	0.704	0.277	0.219	0.663	0.756

Table 1. Performance parameters recorded from 0 to 28d and 0 to 35d.

### HEALTH PARAMETERS

	ACCUMULATED MORTALITY (%)				
	0-7d	0-14d	0-21d	0-28d	0-35d
ANTIBIOTIC	1.00 <sup>a</sup>	1.90 <sup>a</sup>	2.83 <sup>x</sup>	4.83 <sup>a</sup>	6.17
ESSENTIAL OILS	0.17 <sup>b</sup>	0.50 <sup>b</sup>	1.67 <sup>y</sup>	3.00 <sup>b</sup>	4.83
SEM	0.217	0.324	0.542	0.530	0.726
P value	<b>0.022</b>	<b>0.016</b>	<b>0.055</b>	<b>0.034</b>	0.224

Table 2. Weekly accumulated mortality observed throughout the trial from 0 to 35d

- Animals fed with EO diets showed a trend to have heavier gizzards at 21d, while there was no statistical difference at 35d
- A trend for antibiotic treatment's animals to have heavier crops was also observed at 21d only, no such trend at 35d
- There were no relevant findings regarding other organs' weight
- No significant differences were observed in carcass weights or yield

- The accumulated mortality was lower for animals that received the EO treatment until day 28. From 0 to 35 the difference in mortality was only numerical
- At 28d the total mortality in EO birds was of 3% and 4.83% for birds supplemented with antibiotic
- The post-mortem analysis showed no differences in intestinal segments in weight or length

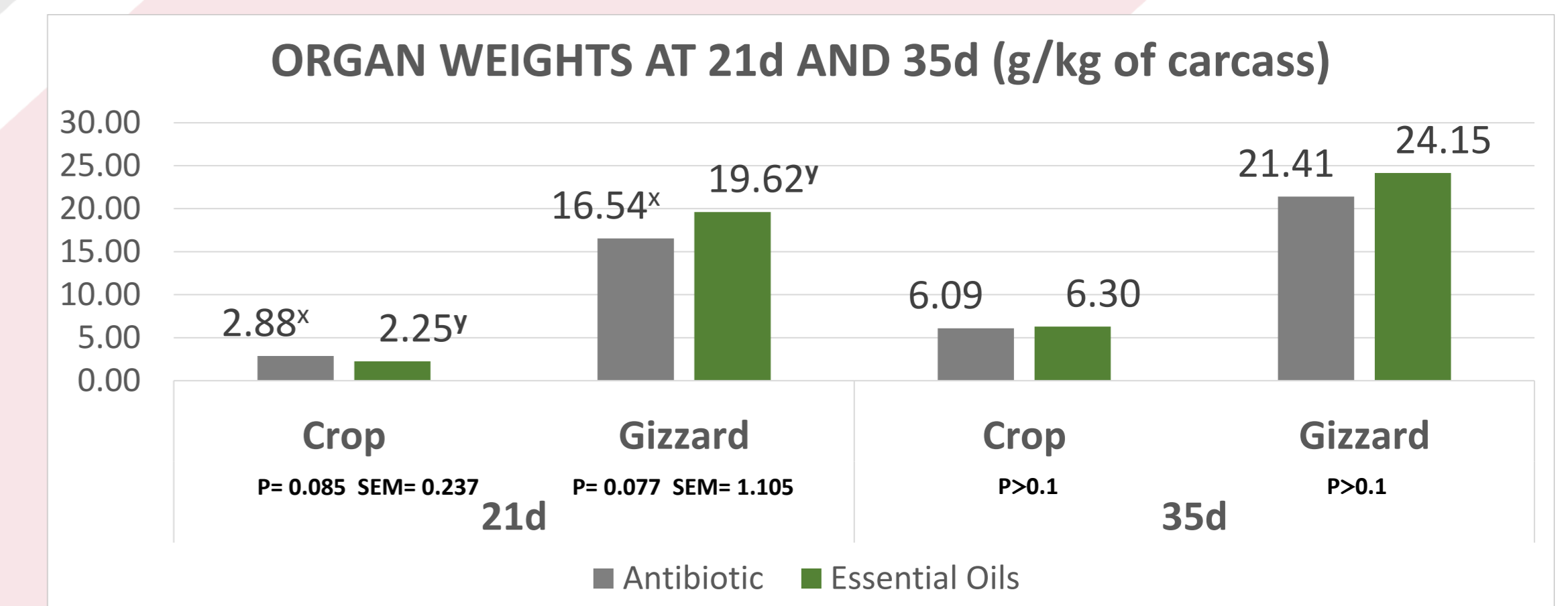


Figure 1. Organ weights obtained in post-mortem analysis both at days 21 and 35

\*a,b different letters mean statistical differences (P<0.05); x,y different letters indicate tendency (0.05 < P < 0.1).

## DISCUSSION AND CONCLUSIONS

- The average mortality of Indonesian broiler farms is 6-7% (USAID, 2013) which was observed in the antibiotic treatment. Essential oils were able to improve the mortality rate
- Early gizzard development has been shown to result in improvements in nutrient digestibility and feed utilization thanks to an increased mechanical and chemical gizzard function and a possibly higher retention time (Sacranie et al., 2011)
- No statistical differences in performance and carcass weight/yield coupled with lower mortality suggest that this EO blend could be a valid alternative to AGPs
- Further investigation should be carried out under commercial conditions to confirm the potential of this particular blend of essential oils



CONTACT DETAILS



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