



# EFFECT OF DIETARY SUPPLEMENTATION WITH SODIUM BUTYRATE AND AROMATIC PLANTS ON CHICKEN MEAT QUALITY



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## INTRODUCTION

Due to antibiotics restriction and social concern about the use of synthetic antioxidants, the study of new alternatives supplements as natural antioxidants and growth promoters are being investigated not only to improve bird's health and performances but also meat quality.

- **Protected sodium butyrate (PSB):** Serve as energy provider for intestinal cells improving productive parameters and, also presents antioxidant properties *in vivo*.
- **Aromatics plants mixture (AP-mix):** Rich in bioactive secondary metabolites with antioxidant, antibacterial, and digestive stimulatory effects.
- However, the effect of the **combination** of PSB and AP-mix on broiler diets is unknown.

## MATERIALS AND METHODS

- 1,320 one-d-old males Ross 308 broilers.
- Experimental period from 1 to 40 d of age.
- 15 replicates/treatments, 60 pens.
- 4 treatments 2 x 2 factorial structured: 2 inclusion levels of PSB (0 vs. 2 g/kg) and 2 inclusion levels of AP-mix (0 vs. 2 g/kg).
- Feeding program consisted in 3 phases (0-12, 12-28, and 28-40 d of age).
- Productive parameters: ADG, ADFI, and FCR.
- Breast muscle quality valuation:
  - Color: Chromameter following CIELAB system.
  - Lipid peroxidation: TBARS method by spectrophotometric measurement at 0, 3, and 6 d after the slaughter.
- Statistical analysis by MIXED procedure of SAS v9.2. Pen was the experimental unit.

## Basal diets

	Starter (0-12 d)	Grower (12-38 d)	Finisher (29-40 d)
<b>Ingredients composition (kg/ton)</b>			
Wheat	374	486	585
Soybean meal, 47% CP	332	304	249
Corn	250	150	100
Molasses	0	5	5
Others <sup>1</sup>	45	55	62
<b>Calculated analyses<sup>2</sup></b>			
AMEn (MJ/kg)	12.14	12.57	13.00
Crude protein (%)	21.76	20.74	18.79
Digestible Lys (%)	1.19	1.06	0.94

<sup>1</sup> Soybean oil, macrominerals, amino acids, and vitamin-mineral premix; <sup>2</sup> According to FEDNA (2019).

## RESULTS

### Productive parameters

Inclusion	0-12 d			12-28 d			28-40 d		
	ADG (g)	ADFI (g)	FCR	ADG (g)	ADFI (g)	FCR	ADG (g)	ADFI (g)	FCR
<b>PSB</b>									
0	32.8	38.9	1.19	90.8	127	1.40	121	211	1.75
2	33.4	38.7	1.16	92.2	127	1.38	117	210	1.79
<b>AP-mix</b>									
0	33.3	39.0	1.17	91.8	127	1.39	119	210	1.77
2	32.9	38.6	1.17	91.2	127	1.39	119	211	1.77
SD	0.936	1.109	0.023	3.627	3.075	0.040	6.454	6.378	0.074
<b>P-value</b>									
PSB	**	NS	***	NS	NS	+	*	NS	*
AP-mix	+	NS	NS	NS	NS	NS	NS	NS	NS

\*No interaction between treatments.

### PROTECTED SODIUM BUTYRATE

Inclusion (g/kg)	L <sup>1</sup>	a <sup>2</sup>	b <sup>3</sup>	Hue angle <sup>4</sup>	Chroma <sup>5</sup>
<b>PSB</b>					
0	56.1	-0.155	7.91	-0.268	8.02
2	56.5	0.458	8.69	0.373	8.79
SD	4.39	1.30	2.62	0.165	2.62
<b>P-value</b>					
	NS	+	NS	+	NS

<sup>1</sup>L<sup>1</sup>: lightness, <sup>2</sup>a<sup>2</sup>: redness, <sup>3</sup>b<sup>3</sup>: yellowness, <sup>4</sup>Hue angle (tone)=arctangent (b<sup>3</sup>/a<sup>2</sup>), <sup>5</sup>Chroma (intensity)=(a<sup>2+2</sup>+ b<sup>3+2</sup>)<sup>0.5</sup>.

### Breast color

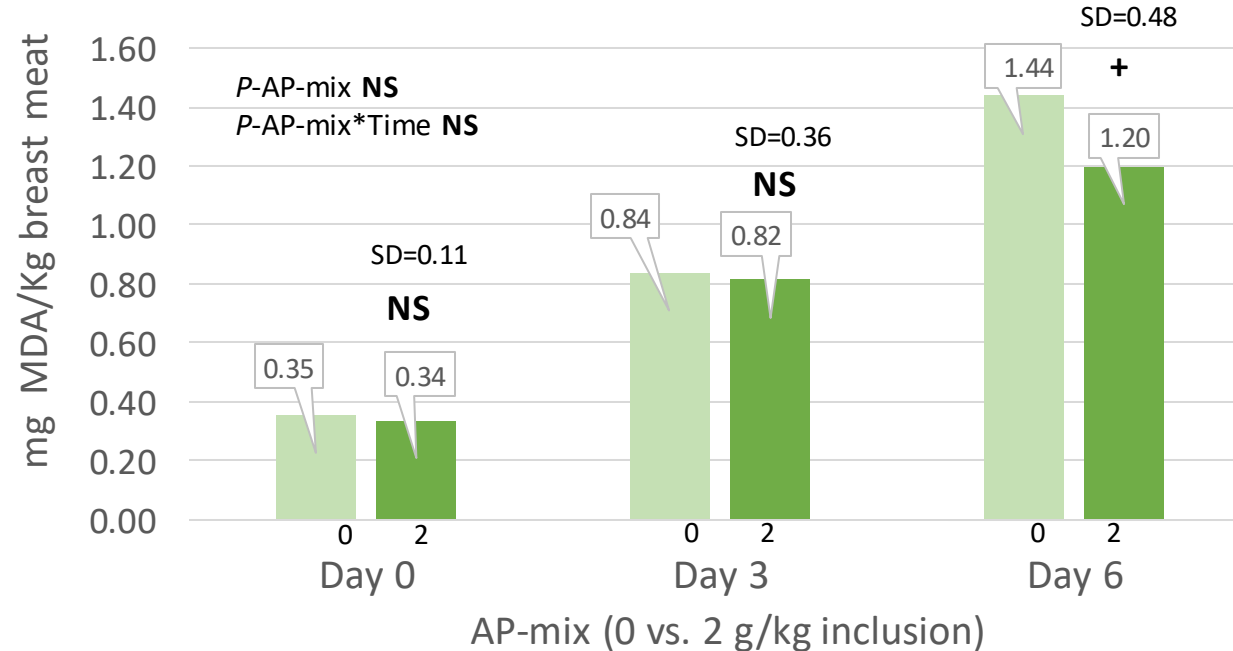
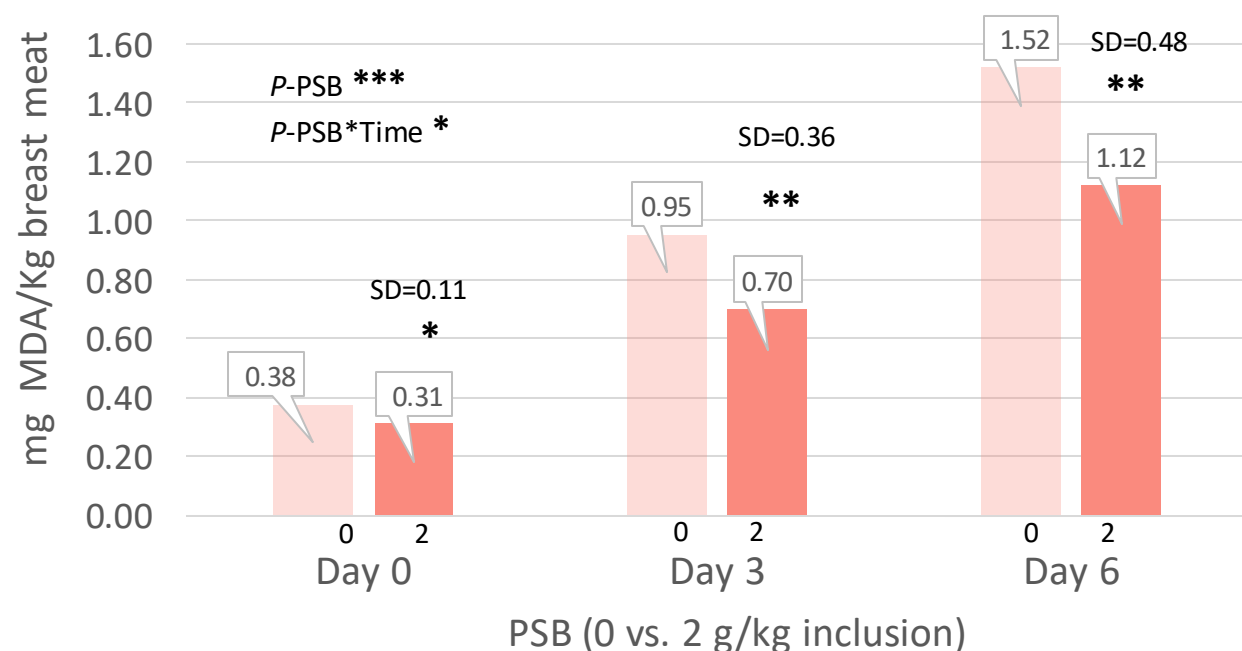
### AROMATIC PLANTS MIXTURE

Inclusion (g/kg)	L <sup>1</sup>	a <sup>2</sup>	b <sup>3</sup>	Hue angle <sup>4</sup>	Chroma <sup>5</sup>
<b>AP-mix</b>					
0	55.8	-0.002	7.56	0.019	7.66
2	56.8	0.305	9.04	0.086	9.15
SD	4.39	1.30	2.62	0.165	2.62
<b>P-value</b>					
	NS	NS	*	NS	*

<sup>1</sup>L<sup>1</sup>: lightness, <sup>2</sup>a<sup>2</sup>: redness, <sup>3</sup>b<sup>3</sup>: yellowness, <sup>4</sup>Hue angle (tone)=arctangent (b<sup>3</sup>/a<sup>2</sup>), <sup>5</sup>Chroma (intensity)=(a<sup>2+2</sup>+ b<sup>3+2</sup>)<sup>0.5</sup>.

### TBARS of breast at 0, 3, and 6 d after the slaughter

P-Time \*\*\*\*



## CONCLUSIONS

Supplementation diet with **PSB+AP-mix** did not present interaction.

- **PSB** The biggest effect of **PSB** on productive performances was observed in young animals (0-12 d of age). This effect was decreasing with the age.
- **PSB** tended to affect the color of the breast and reduced lipid peroxidation.

- **AP-mix** Did not present a great impact on productive parameters.
- **AP-mix** affected the color and intensity of the breast and tended to control lipid peroxidation (on d 6 after slaughter).

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