



The effect of hydrolysed yeast on production performance and gastrointestinal health in broilers

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DIVAS, UNIMI, IT

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Objective and Background

- Animal nutrition is crucial to achieve the EU Green Deal's objectives.
- **EU → contemporary, resource-efficient, and competitive economy by 2050.**
- **Farm to Fork (Sustainability)**
- **Feed additive (Innovation)**
- The EU Sustainability Goals (NP/EFSA/FEEDCO/2022/02) heavily rely on them. The **CAP (common agricultural policy)** 2023-27 contains a number of policy reforms to support the transition towards sustainable agriculture and forestry in the EU.



Aim of Project

- Yeast an alternative
- Role of different forms of yeast
- **Hydrolyzed Yeast**

Overall Aim of current experiment is to the effect of hydrolysed yeast on

- **Growth performance**
- **Meat quality**
- **Gut Health**

Yeast-Derived Products: The Role of Hydrolyzed Yeast and Yeast Culture in Poultry Nutrition—A Review

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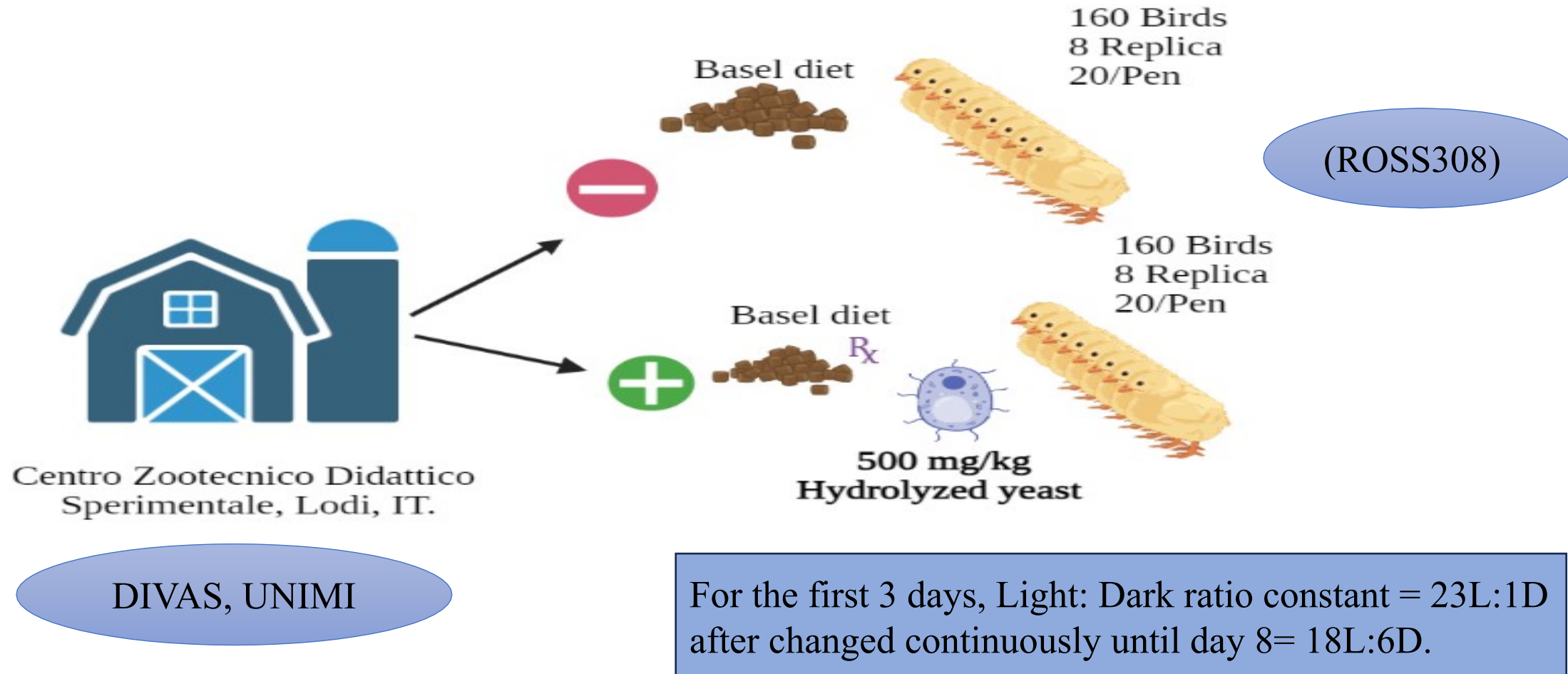
Table 1. Main effects of hydrolyzed-yeast (HY), autolyzed-yeast (AY), and yeast-culture (YC) administration on the immune response of poultry.

Yeast Product	Animal Type	Challenge	Effect
AY	Broiler	Live vaccine against coccidiosis	↓ TLR-4 and ↑ IL-1β expression
AY	Broiler	Salmonella lipopolysaccharide	↓ spleen and ↑ bursa weight ↑ WBC count, albumin, and IgG
HY	Broiler	NDV, IBV, avian-influenza-vaccination protocol	↑ antibody titer
			↑ serum antioxidant enzyme, IgY, IgM, and IgA

Table 2. Main effects of hydrolyzed-yeast (HY), autolyzed-yeast (AY), and yeast-culture (YC) administration on gut microbiota of poultry.

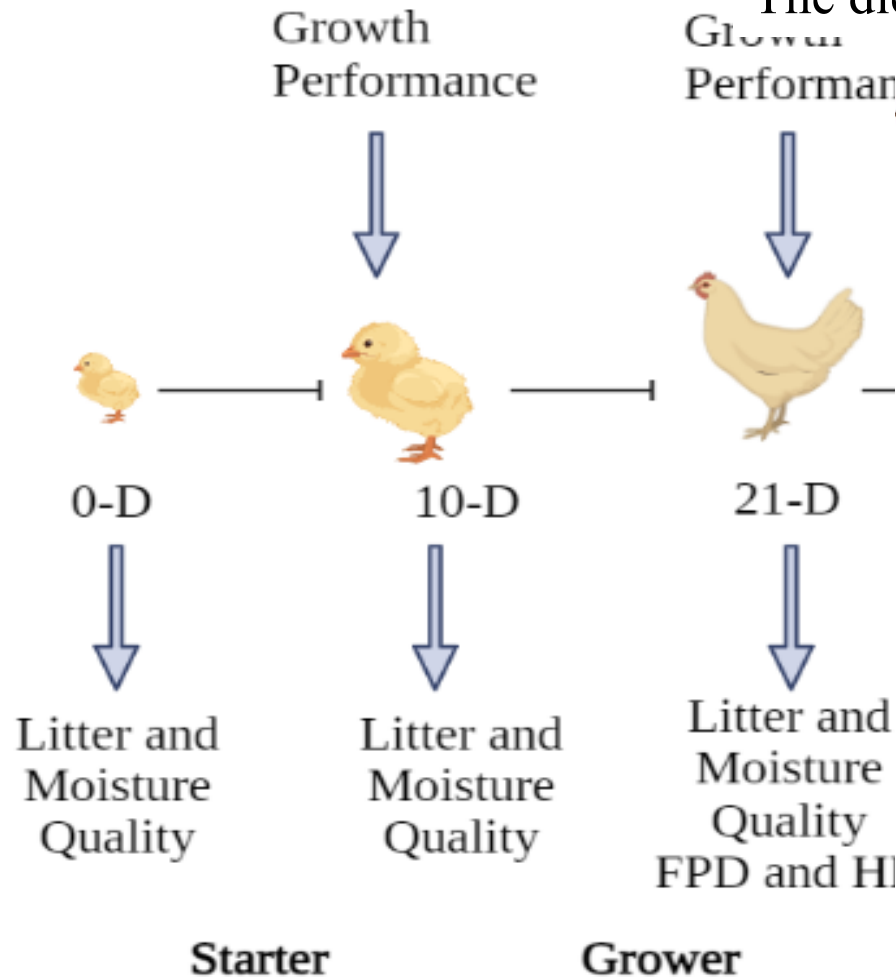
Product	Model	Effect	Method
AY	Broiler	↑ <i>Enterococcus</i> and ↓ <i>Lactobacillus</i>	Bacterial cultures
		↓ <i>E. coli</i>	Bacterial cultures
HY	Broiler	↑ <i>Lactobacillus</i> and ↓ <i>E. coli</i>	Bacterial cultures
	Laying hens		

Experimental Design



Material and Method

The diet were provided by Nutri-Tech S.R.L. (Villimpenta, MN).



Diet composition and nutrient levels

Item	Starter diet 1-10	Grower diet 10-21	Finisher diet 21-42
Ingredient, g/kg			
Corn	55.05	57.40	61.67
Soybean meal (48%)	37.30	34.10	29.20
Soybean oil	3.00	4.30	5.30
Dicalcium phosphate	2.50	2.50	2.10
Calcium carbonate	0.70	0.45	0.50
Mineral + Vitamin Premix	0.50	0.50	0.50
NaCl	0.40	0.40	0.40
DL-Methionine	0.30	0.18	0.16
L-Lysine HCl	0.23	0.17	0.17
Total	100	100	100
Nutrients level			
ME, MJ/kg	3003.36	3100.26	3200.48
Crude protein, g/kg	22.63	21.16	19.14
Crude fat, g/kg	1.28	1.16	1.04
Crude fiber, g/kg	0.91	0.74	0.68
Calcium, g/kg	0.62	0.46	0.42
Phosphorus, g/kg	1.40	1.27	1.13
Lys, g/kg	1.00	0.83	0.76
Met + Cys, g/kg	0.64	0.49	0.44

Foot Pad Dermatitis (FPD)

Hock Burn (HB)

Statistics



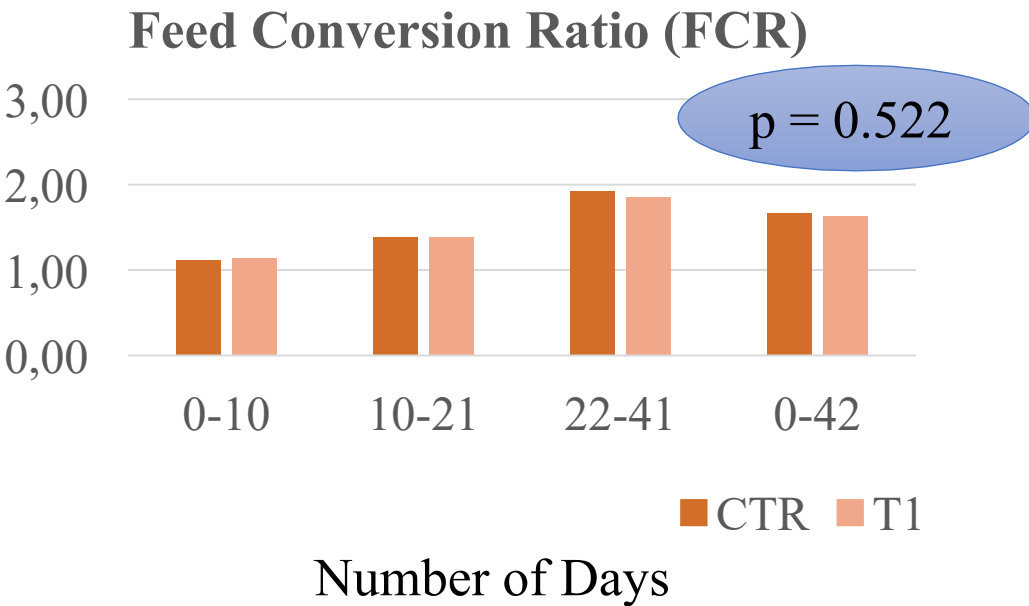
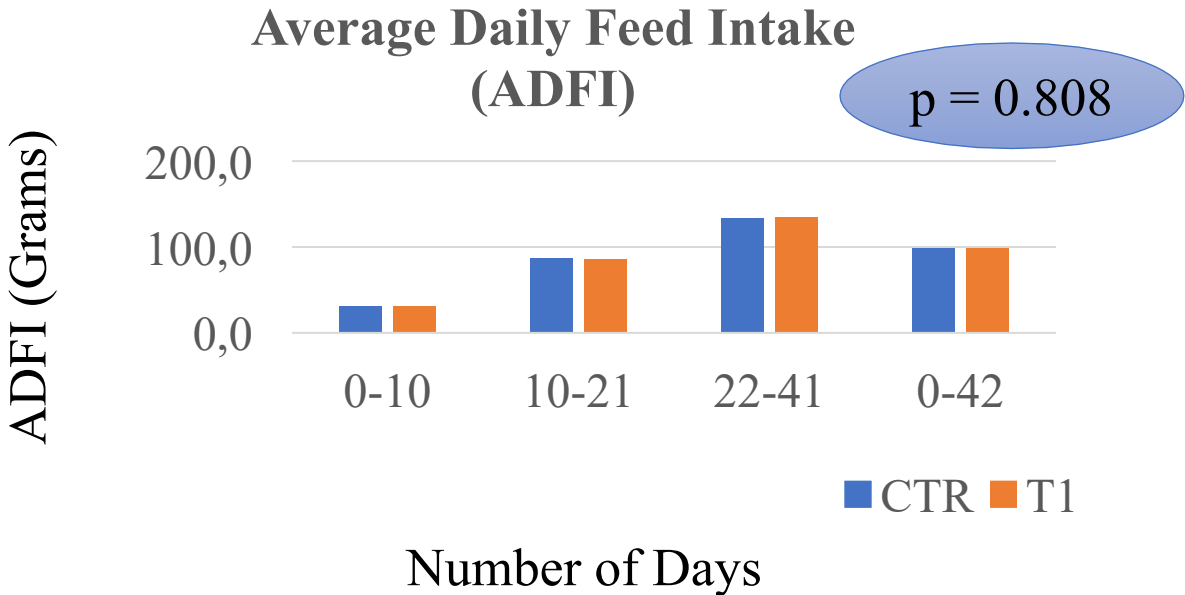
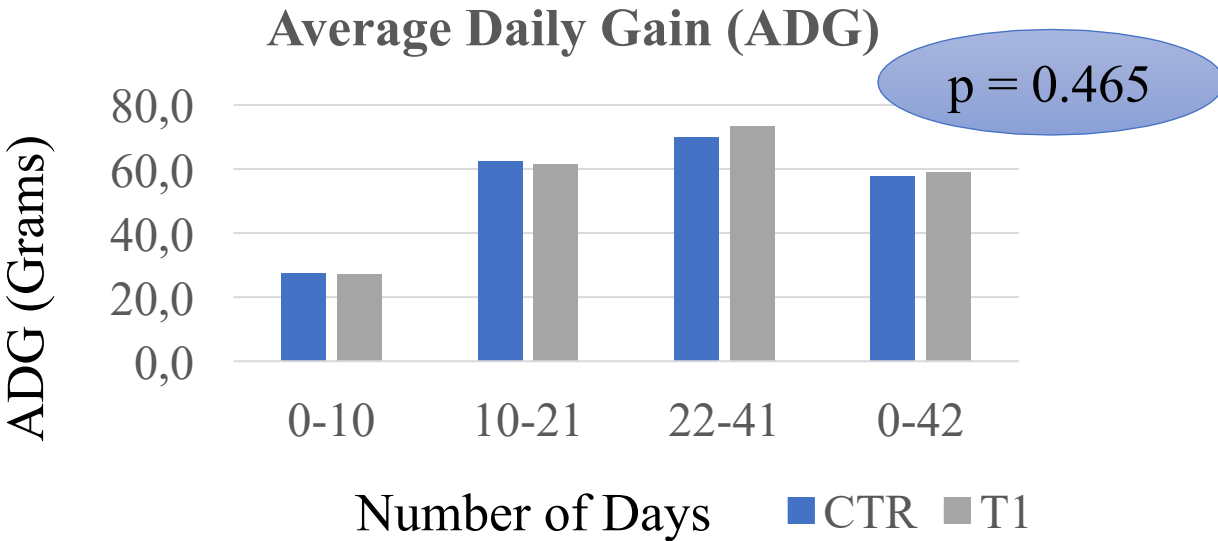
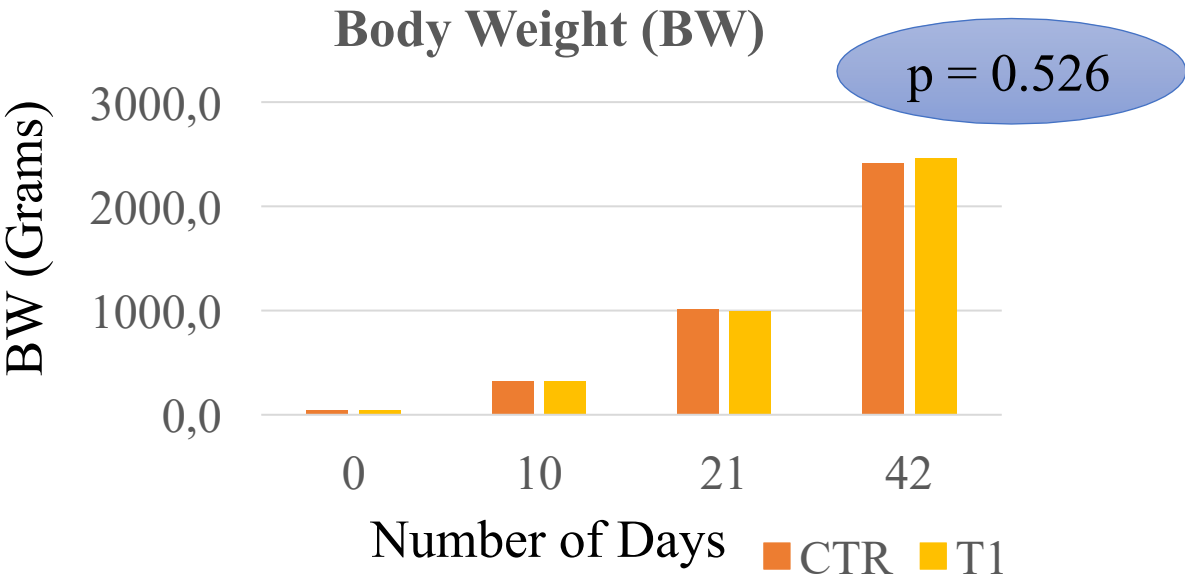
- The data was analyzed using Statistical Analysis System software (SAS version 9.4; SAS Institute Inc., Cary, NC, USA)
- Mixed Procedure (Growth performance, Treatment, time and treatment $\times$ time interaction)
- GLM of SAS (Slaughter Yield, Organ Weight)
- PROC FREQ of SAS (Mortality rate, FPD, and HB)

Experimental Units

- The pen $\rightarrow$ (Growth Performance and Litter Parameters),
- The broiler $\rightarrow$ (Slaughter Yield, Organ Weight, and FPD and HB).

- Differences between groups were considered statistically significant at $p < 0.05$, trend for a treatment effect $0.05 \leq p < 0.10$.

Analysis and Results (Performance)



Analysis and Results (Litter and Diseases)

Litter Dry Matter (DM)

	CTR	T1	SEM	Treatment	Time	Treatment* Time
0	89.29	89.72	0.4972	0.8458	<.0001	0.6462
10	82.16	81.47				
21	68.83	70.33				
41	69.77	69.09				

Foot Pad Dermatitis (FPD)

Days	Birds with lesions % CRT	Birds with lesions % T1	P Significance
21	0	4.17	0.3122
41	12.5	8.33	0.6366

No available data to compare LQ, DM, FPD and HB.

Litter Quality (LQ)

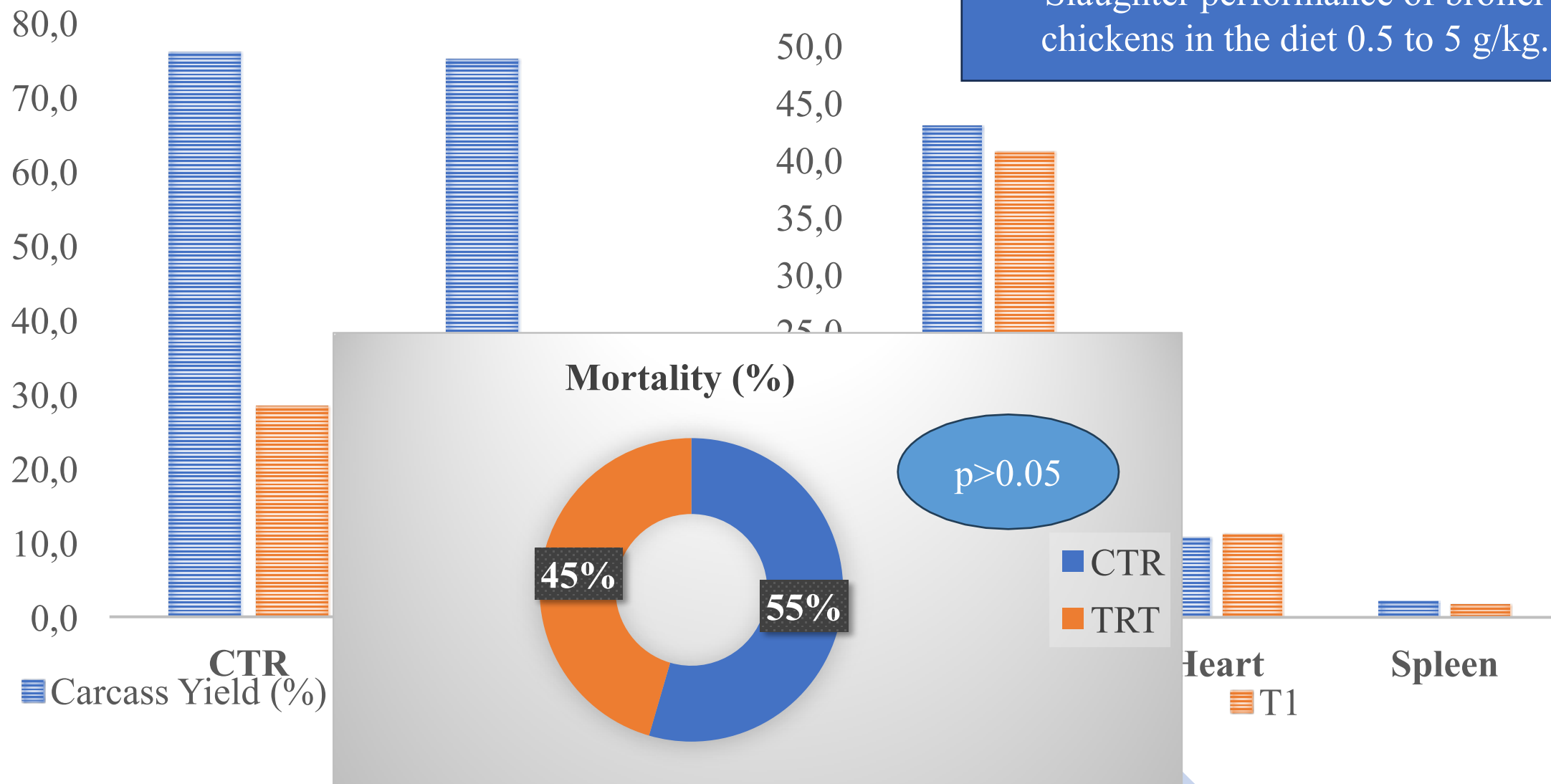
	CTR	T1	SEM	Treatment	Time	Treatment* Time
0	0.0	0.0	0.093	0.642	<.0001	0.8779
10	0.0	0.0				
21	1.0	1.0				
41	1.6	1.5				

Hock Burn (HB)

Days	Birds with lesions % CRT	Birds with lesions % T1	P Significan ce
21	0	0	
41	4.17	0	0.3122

Analysis and Results (Slaughter)

Different studies → HY improve Slaughter performance of broiler chickens in the diet 0.5 to 5 g/kg.



Analysis and Results (Meat Quality)

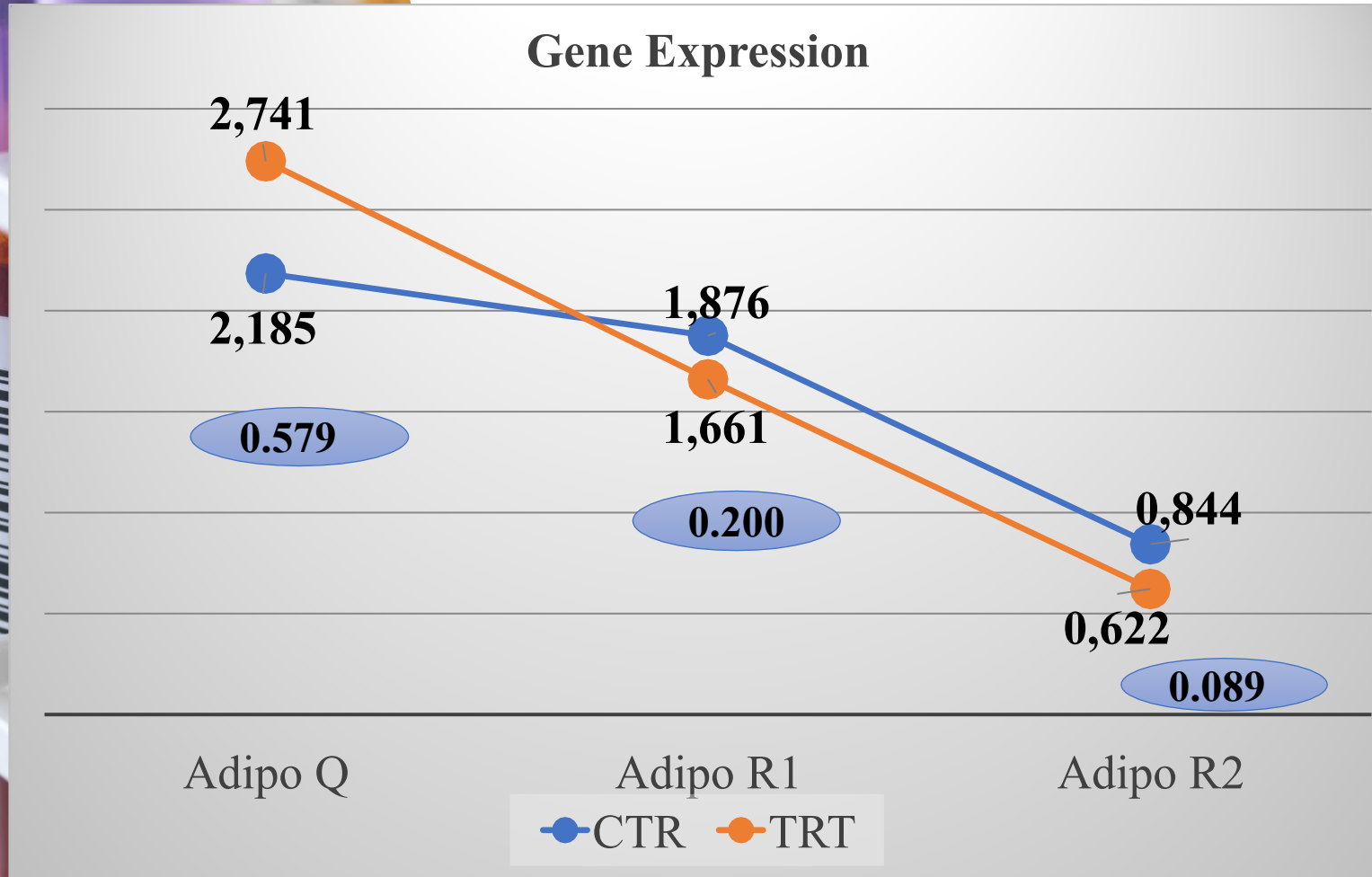
	CTR	T1	SEM	Treatment
pH	5.99	6.08	0.0423	0.110
WHC	0.49	0.59	0.0682	0.289
Colour				
				0.66
				0.94
b*	7.25	6.85	0.4662	0.528

Sampath et al., 2021 → HY supplementation had no impact on WHC.

Hoque et al., 2021 → yeast components had no effect on meat quality measures.

WHC = Water Holding Capacity; L^* = lightness; a^* = redness; b^* = yellowness

Analysis and Results (Gene Expression)



ing performed on
f HY on molecular
on gut health.

e immune system,
n (**AdipoQ**, **Adipo**
d tight junctions
audin-3) was being

Conclusion

No Significant difference ($p > 0.05$) has been observed in both groups in terms of
Growth Performance (BW, ADG, ADFI and FCR)

Slaughter yield and Organ weight

Meat Quality (pH, WHC, Color)

Litter (Quality and DM); Lesions (FPD and HB)

Gene Expression Adiponectin (Receptor 1 and 2) and Tight Junctions

NEXT?

➤ Microbiota of jejunum
content (Metabolomics)



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