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THEME:

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EFFECT OF STOCKING DENSITY AND QUERCETIN ADMINISTRATION ON pH OF BREAST MEAT AND ERYTHROCYTE OSMOTIC FRAGILITY IN BROILER CHICKENS DURING THE RAINY SEASON

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INTRODUCTION

- Stocking density has become a major issue in the debate on broiler welfare.

- A high or very low- stocking density may compromise on broiler welfare, directly or indirectly, and increase values of stress indicators by influencing physiological and biochemical parameters in the body.

INTRODUCTION CONT'D

- Health benefits of quercetin has been reported.

- However, no study has been conducted to evaluate its effect on pH of broiler breast meat and osmotic haemolysis of erythrocyte of broiler chickens, reared under different stocking densities.

Material and Methods

Location:

Experimental Animals and Management;

Experimental Design;

- **18 birds/m2 – Without Quercetin**
- **18 birds/m2 + Quercetin**
- **12 birds/m2 – Without Quercetin**
- **12 birds/m2 + With Quercetin**

***Ad libitum* feed and water**

Material and Methods Cont'd

- Determination of Erythrocyte Osmotic Fragility:
- Determination of pH of Breast Meat:

Data Analysis

- **Values were expressed as mean ± standard error of the mean (± SEM).**
- **Data were analysed using repeated-measures one-way analysis of variance (ANOVA).**

- **Tukey's *post-hoc* test; using Graphpad Prism, version 4.0 for Windows**
- **$P < 0.05$ were considered significant (Snedecor and Cochran, 1994).**

Results and Discussion

- **Table 1. Effect of quercetin and stocking density on pH of meat of 42-day-old broiler chickens**

Groups	Day 1	Day 2	Day 3	Day 4
18 birds/m^2	5.47 ± 0.06^{a}	5.64 ± 0.10^{a}	$5.96 \pm 0.08^{2,b}$	$6.02 \pm 0.04^{1,b}$
18 birds/m^2 + Quercetin	5.51 ± 0.05^{a}	5.57 ± 0.05^{a}	$5.73 \pm 0.09^{1,a}$	$5.98 \pm 0.03^{1,b}$
12 birds/m^2	5.49 ± 0.10^{a}	5.61 ± 0.05^{a}	$5.68 \pm 0.07^{1,a}$	$5.99 \pm 0.04^{1,b}$
12 birds/m^2 + Quercetin	5.47 ± 0.08^{a}	5.54 ± 0.06^{a}	$5.71 \pm 0.09^{1,a}$	$6.09 \pm 0.04^{1,b}$

Superscripts with different numbers vary significantly ($P < 0.05$) within columns. Superscripts with different letters vary significantly ($p < 0.05$) within rows.

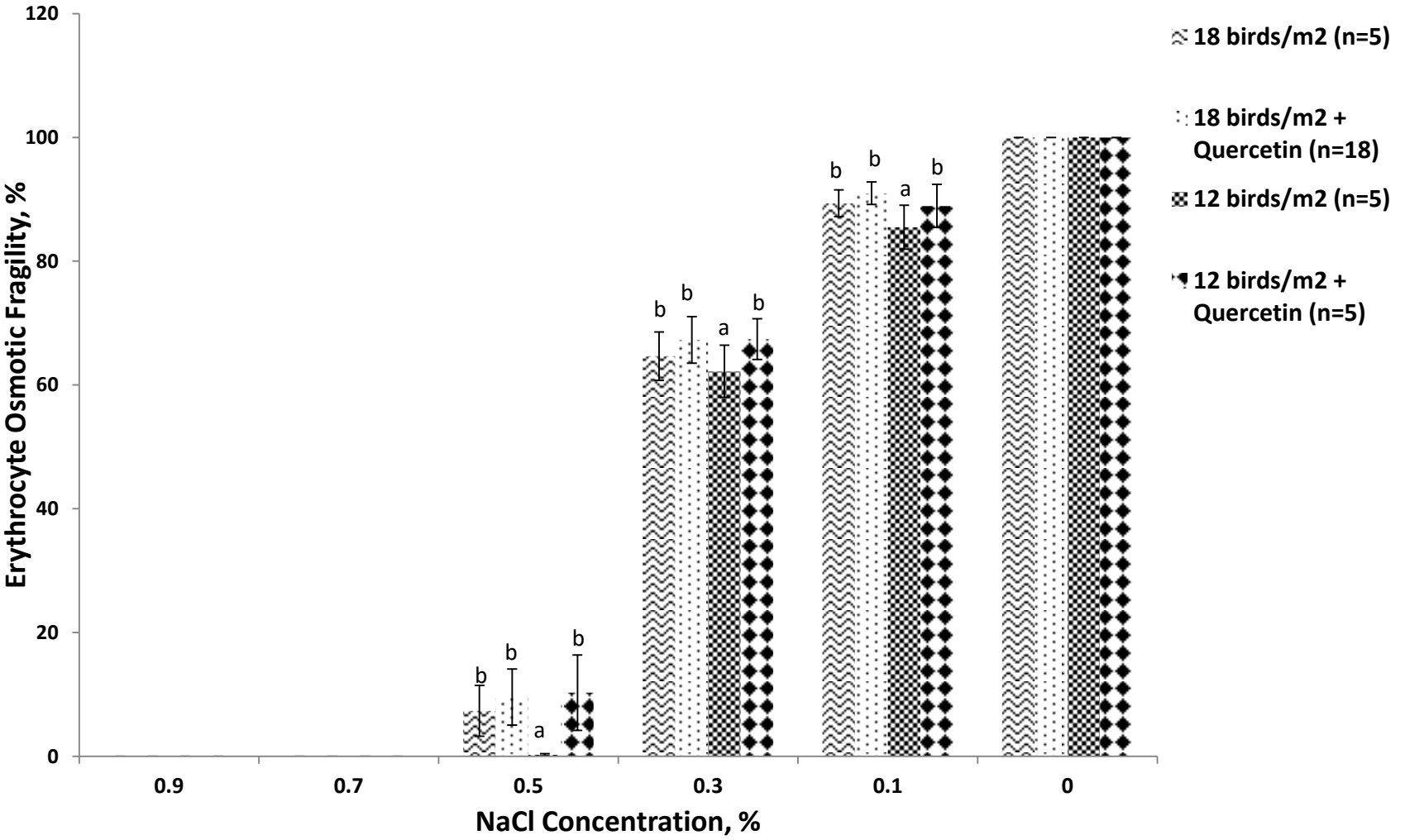

Fig 2: Overall variation in Erythrocyte Osmotic Fragility of Ross 308 Broiler Chickens reared at different stocking densities and administered with Quercetin during the experimental period (n=5);

$^{a, b}$ = Means at the same NaCl concentration having different superscript letters are significantly ($P < 0.05$) different

Results and Discussion Cont'd

- **A higher pH is an indication of meat deterioration (Wapi *et al*., 2013; Rahman *et al*., 2016)**

- **Quercetin preserved meat quality on storage by inhibiting lipid peroxidation (Kalendar *et al*., 2012; Goliomytis *et al*., 2014)**

- **Quercetin, a double edged sword (Bouayed and Bohn, 2010), has been reported to increase erythrocyte osmotic fragility in humans (Yousif and Shtaywy, 1998)**

Conclusion

- **12 birds/m2 – without Q (lowest erythrocyte osmotic fragility value)**
- **EOF increased in 12 birds/m2 + Q**
- **Earliest significant increase in pH occurred in 18 birds/m2 – without Q**

Recommendations:

- **Administer Q to broilers prevent early meat deterioration**
- **Prooxidant and antioxidant role of Q and, mechanism involved should be further studied.**

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Thank you for listening !!!