



PHYTOGENIC FEED ADDITIVES: IMPACT OF ECHINACEA AND SEA BUCKTHORN ON THE PRODUCTIVITY OF BROILER CHICKENS

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Abstract: In light of growing restrictions on antibiotic use in animal husbandry, this study evaluated hydroalcoholic extracts of *Echinacea purpurea* and *Hippophae rhamnoides* (sea buckthorn) as natural alternatives for improving broiler performance. Ninety broilers were assigned to three groups: control, Echinacea (0.3%), and sea buckthorn (0.3%), administered via drinking water for 42 days. Monitored parameters included final weight, daily gain, specific feed intake, and growth efficiency. Treated groups outperformed the control, with sea buckthorn showing the highest final weight (2494.88 g), daily gain (58.42 g), and feed efficiency (159.63 g/100 g gain). These results highlight the potential of phytogenic additives as sustainable growth promoters in poultry nutrition.

• Introduction

The global poultry industry is shifting toward sustainable practices and reduced antibiotic use, driven by concerns over food safety and public health. In Romania, poultry remains a strategic sector, with rising consumption and notable productivity, especially in intensive systems using ROSS 308 hybrids. As antibiotic restrictions grow, attention has turned to natural alternatives like plant extracts rich in antimicrobial and immunostimulatory compounds. *Echinacea purpurea* and *Hippophae rhamnoides* (sea buckthorn) are among the most promising, offering benefits for broiler health and performance. This study evaluates the effects of hydroalcoholic extracts of these plants, administered in drinking water, on growth metrics in ROSS 308 broilers over 42 days, providing insight into their potential as phytogenic feed additives.

• Material and method

The experiment involved 90 one-day-old ROSS 308 broiler chicks (average 41.33 g), randomly divided into three equal groups housed in identical pens with controlled temperature, humidity, and lighting, and fed a standard NRC-based diet across starter, grower, and finisher phases. Group 1 served as control (no supplement), Group 2 received 0.3% hydroalcoholic Echinacea extract, and Group 3 received 0.3% sea buckthorn extract, both added daily to drinking water for 42 days. Extracts were sourced from *Hypericum Impex* and adapted for poultry use. The trial included three monitoring stages (days 1–14, 15–30, 31–42), during which four performance parameters were assessed: specific feed intake, average daily gain, growth efficiency, and final body weight. Data were analyzed using one-way ANOVA and t-tests, with significance set at $p < 0.05$.

• Results and discussions

The comparative analysis of the productive performance of broiler chickens revealed statistically significant differences among the three experimental groups (Control, Echinacea, Sea Buckthorn) for all parameters included in the study (Tabel 1).

This study highlights that the administration of plant extracts had a positive impact on all productive parameters, with the best results recorded in the Sea Buckthorn group, followed by Echinacea—both significantly outperforming the control group. These results support the hypothesis that supplementing drinking water with medicinal plant extracts can be a viable alternative to synthetic additives in broiler chicken production.

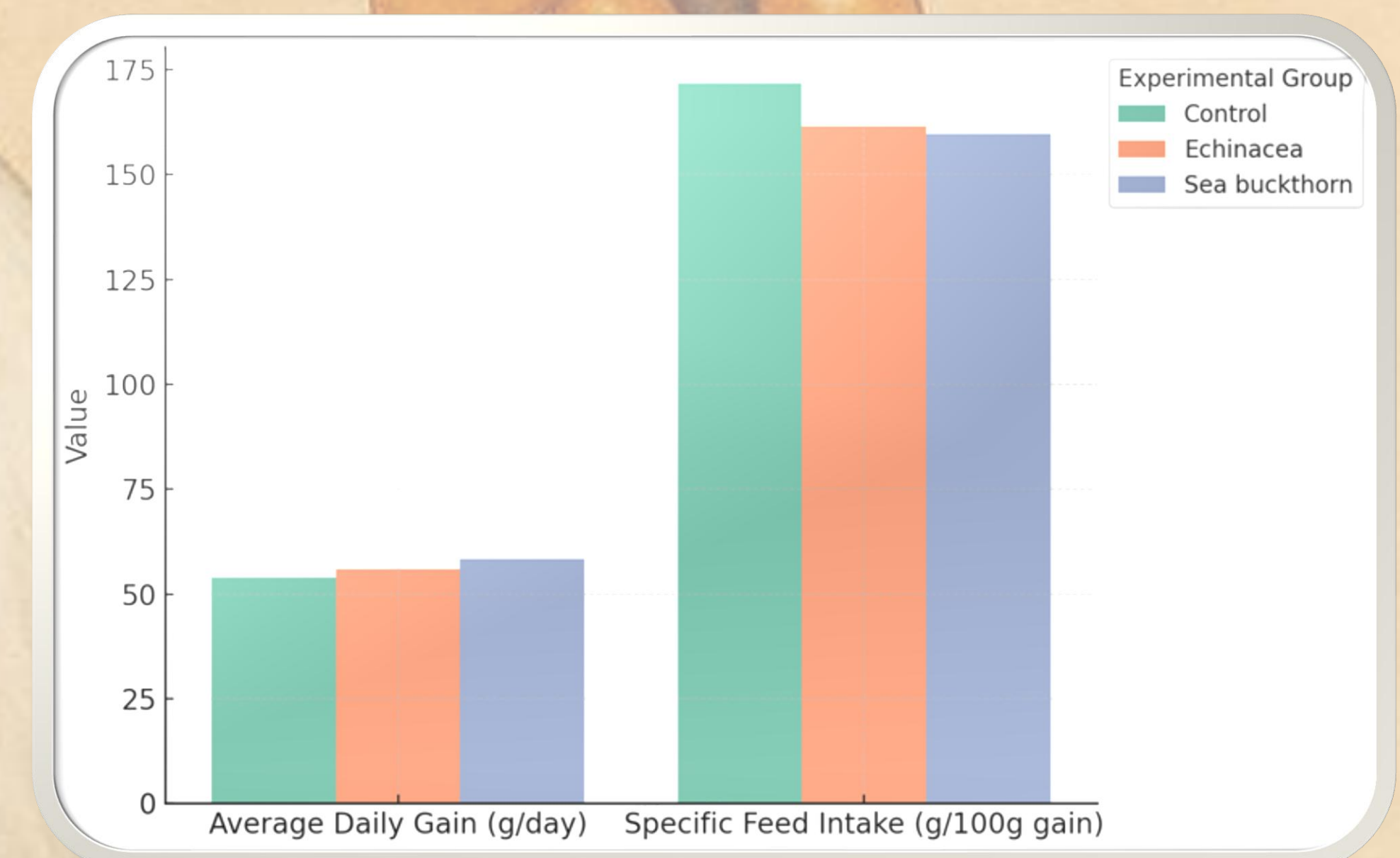


Fig. 2. Comparison of Average Daily Gain and Specific Feed Intake in Broiler Chickens by Experimental Group

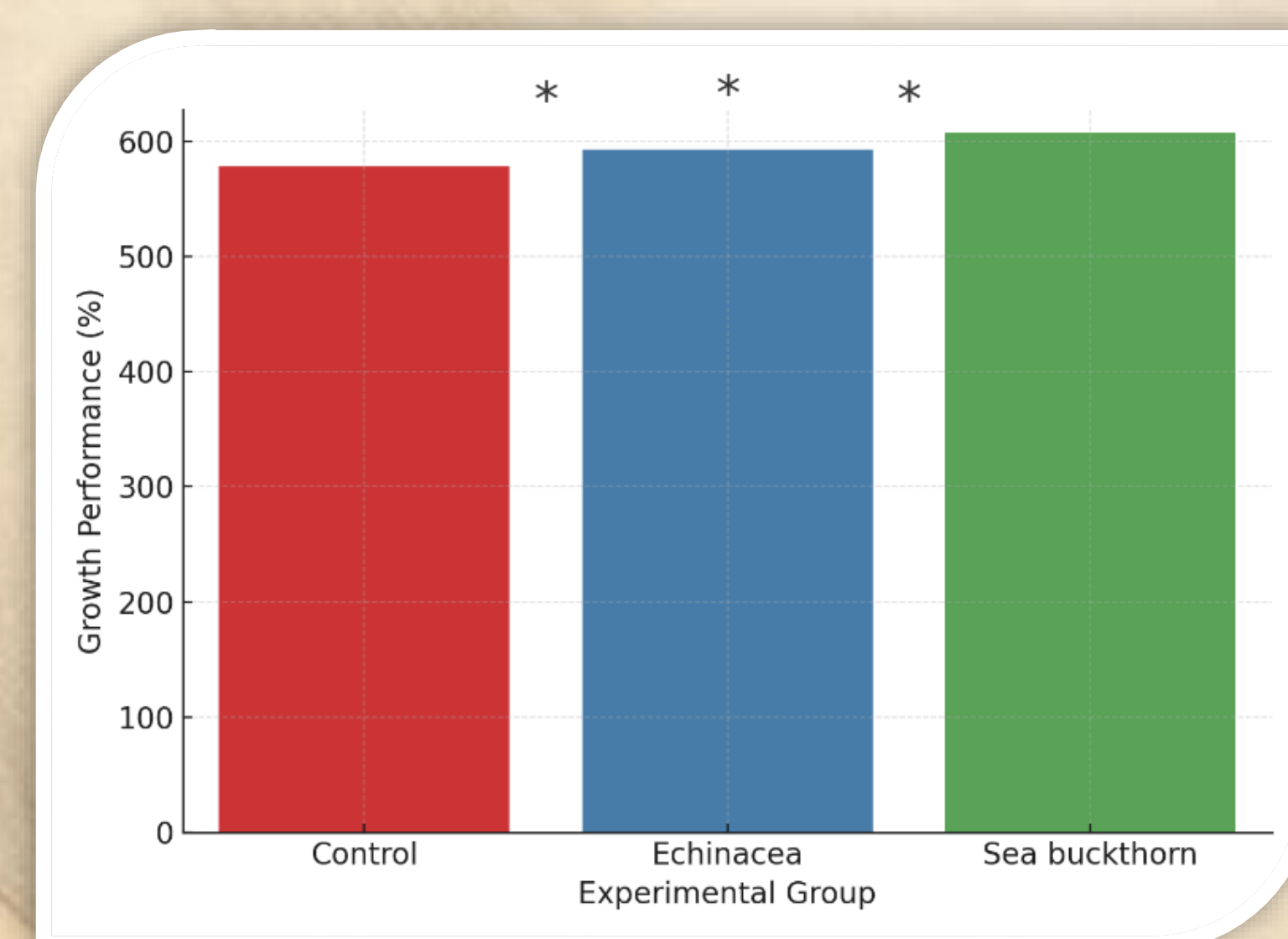


Fig. 3. Growth Performance of Broiler Chickens Across Experimental Groups

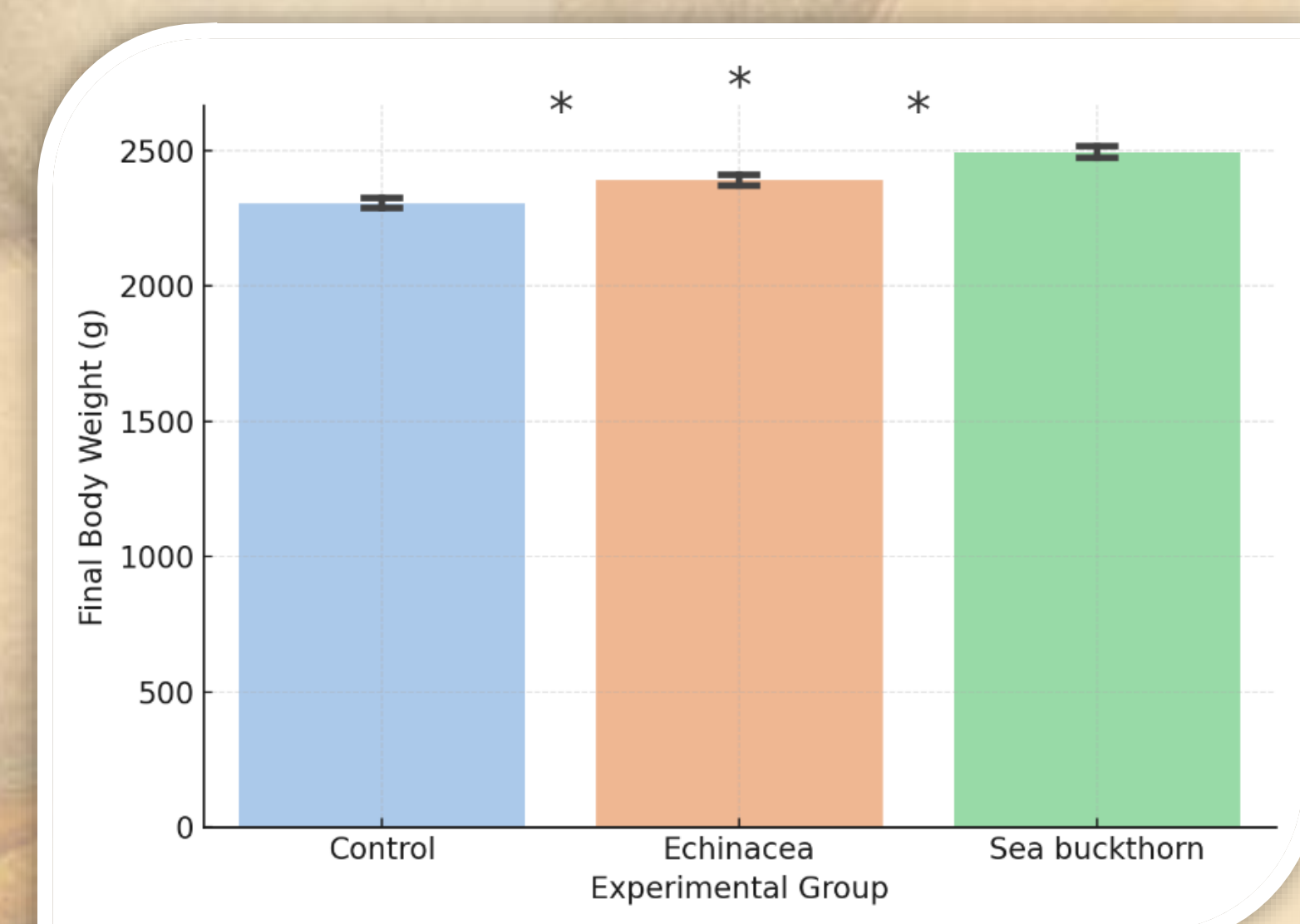


Fig. 1. Final Body Weight of Broiler Chickens by Experimental Group

Tabel 1. Growth Performance and Feed Efficiency Parameters in Broiler Chickens by Experimental Group						
Group	Final Weight (g)	Total Weight Gain (g)	Total Feed Intake (g)	Average Daily Gain (g/zi)	Specific Feed Intake (g/100g)	Growth Performance (%)
Control	2307.05	2265.66	3893.22	53.94	171.83	55.75
Sea buckthorn	2494.88	2453.51	3916.65	58.42	159.63	60.31
Echinaceea	2391.58	2350.43	3797.89	55.96	161.58	58.13

Conclusions: This study demonstrated that supplementing broiler drinking water with hydroalcoholic extracts of *Echinacea purpurea* and *Hippophae rhamnoides* significantly improved growth performance, feed efficiency, and daily gain, with the best results in the Sea Buckthorn group. These phytogenic additives offer a sustainable, effective alternative to synthetic growth promoters, supporting animal health and productivity while aligning with efforts to reduce antibiotic use in poultry farming.