

# Comparison of the effects of *Opuntia ficus-indica* powder on growth performance and serum parameters of the Broiler Chicken in Algeria

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## INTRODUCTION

In Algeria, the ingredients used in broiler's feed are exclusively imported from abroad, which affects negatively the production cost of chicken meat and sale price at national level. Because of the wide diversity in soil and climate, Algeria owns a substantial number of plants which could be used in animal feed. This work is part of feed potential valuation of barbaric fig tree, widely present in rural Algerian landscape, in broiler chicken. *Opuntia ficus-indica* is known for its edible fruits and fleshy leaves or "racquets" as fodder, especially during drought periods. It also is used to mitigate water and wind erosion and keeping soil fertility in arid and semi-arid regions. The aim of this study was to measure the effects of *Opuntia ficus-indica* powder on growth performance, serum parameters and carcass characteristics of broiler chickens.

## MATERIALS AND METHODS

In total, 120 Ross-308 day-old male chicks were monitored. They were randomly divided in 3 groups (Group 1, 2 and 3) and 4 blocks according to the specific diets. The Group 1 was offered a commercial feed. The Group 2 and Group 3 were offered the same commercial feed as Group 1 where 5% and 10%, respectively, of the commercial feed was replaced with *Opuntia ficus-indica* powder.



Table 1- Analytical composition of *Opuntia ficus-indica*

	DM (%)	Ash (%MS)	CP (% MS)	CF (%MS)	EE (% MS)
Mean	92.0	27.8	6.1	7.4	1.5
Standard Deviation	0.64	0.94	0.14	0.25	0.07

## RESULTS

*Opuntia ficus-indica* incorporation did not show any negative effect ( $p > 0.05$ ) on final body-weight, average daily gain and carcass yield. However, it decreased ( $p < 0.05$ ) plasma glucose, uremia, cholesterol and triglycerides levels.

Table 2- Growth performances and feed conversion index of the different groups

	10% Opuntia	5% Opuntia	Commercial feed	Effects			R <sup>2</sup>
				Feed (F)	Block (B)	T*B	
Body-weight (g)							
Day 0	45±0.57 <sup>a</sup>	43±0.57 <sup>b</sup>	44±0.58 <sup>ab</sup>	NS	***	**	0.52
Day 7	130±3.6	169±3.54	150±3.6	***	***	NS	0.50
Day 14	309±11.5 <sup>a</sup>	390±11.5 <sup>b</sup>	349±11.5 <sup>c</sup>	***	**	NS	0.34
Day 21	726±24.1	792±24.1	785±21.1	NS	NS	NS	0.09
Day 28	1060±28.7 <sup>a</sup>	1152±28.7 <sup>b</sup>	1142±28.8 <sup>b</sup>	NS	*	NS	0.18
Day 35	1662±53.0	1791±53.0	1710±53.1	NS	NS	NS	0.06
Day 42	1877±44.4	1972±43.1	1949±43.2	NS	NS	NS	0.06
ADG (g)							
0-14 days	18.9±0.83 <sup>a</sup>	24.7±0.83 <sup>b</sup>	21.9±0.83 <sup>c</sup>	***	***	NS	0.35
15-42 days	56.2±1.70	56.4±1.64	57.2±1.65	NS	NS	NS	0.05
0-42 days	43.6±1.05	45.9±1.02	45.4±1.02	NS	NS	NS	0.06
FCR							
0-14	1.31	1.22	1.28				
15-42	2.05	1.97	1.95				
Mortality (%)							
0-14	7.50	5.00	10.00				
15-42	5.00	5.00	0.00				

Table 3- Carcass yields

	10%	5%	Commercial	Feed-effect	R <sup>2</sup>
Carcass-weight (g)	1426±45.5	1485±45.5	1439±45.5	Ns	0.03
Carcass-yield (%)	69.8±0.54	70.7±0.55	70.2±0.54	Ns	0.04
Gizzard-weight(g)	48.2±0.79 <sup>a</sup>	43.1±0.79 <sup>b</sup>	40.0±0.79 <sup>c</sup>	***	0.63
Liver-weight(g)	58.4±1.22 <sup>a</sup>	52.4±1.22 <sup>b</sup>	54.1±1.22 <sup>b</sup>	**	0.28
Abdominal fat weight(g)	22.6±0.78 <sup>a</sup>	28.1±0.78 <sup>b</sup>	32.6±0.78 <sup>c</sup>	***	0.71

Table 4- Biochemical parameters of the different groups

	10%	5%	Commercial	Feed	R <sup>2</sup>
Triglycerides (g/l)	0.50±0.02 <sup>a</sup>	0.55±0.02 <sup>ab</sup>	0.58±0.02 <sup>b</sup>	*	0.23
Glucose(g/l)	1.83±0.05 <sup>a</sup>	2.01±0.05 <sup>b</sup>	2.09±0.05 <sup>b</sup>	***	0.35
Uremia (g/l)	0.020±0.001 <sup>a</sup>	0.023±0.001 <sup>b</sup>	0.019±0.001 <sup>a</sup>	**	0.27
Total protein(g/l)	25.2±0.58	26.1±0.58	26.0±0.58	Ns	0.04
Cholesterol (g/l)	0.80±0.06 <sup>a</sup>	1.10±0.03 <sup>b</sup>	1.20±0.06 <sup>c</sup>	***	0.36

\*\* P<0.001; \* P<0.01; \*P<0.05; NS: P>0.05. a, b, c: different superscripts indicate significant differences (P<0.05).

## CONCLUSION

*Opuntia ficus-indica* powder could be incorporated in poultry feed to reduce broiler feed's cost in Algeria.