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Impact of Arabic gum powder on the growth performance and health status of Chickens

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Abstract

The objective of this study was to determine the effects of Arabic gum (AG) powder on the performance and blood chemistry of local chicken breeds. One hundred and eighty 14-day-old chickens were included in the experiment. The response criteria were average weight increase, feed intake, feed conversion ratio, dressing %, non-carcass components (heart, gizzard, and liver), and blood serum parameters. Results showed that adding 5% (AG) to the diet significantly increased daily gain, live weight (1710 gm), and carcass traits while decreasing feed intake (3320 gm) and feed conversion ratio. Blood analysis results were not significantly different between groups. Economic efficiency was also evaluated, and it was found that adding AG to the control diet improved the general performance of chicks and led to lower feed consumption and higher profits. In conclusion, supplementing feed with 5% (AG) can improve the performance and profitability of local breeds.

Keywords: chickens, growth, performance, gum powder

Introduction

The surge in chicken production and consumption in Algeria could be attributed to various factors, including the populace's penchant for white meat over less expensive meat cuts. However, given that feed expenses account for 70-75% of the overall production costs, reducing feed costs and enhancing feed utilization efficiency are the only feasible strategies to yield profitable poultry production, according to Qureshi (1991). The use of dietary supplements in animal feed is a common practice to enhance growth and improve health. In the case of chicken breeds, dietary supplements can be used to enhance their growth, improve immune function, and prevent diseases. There has been ongoing research on the use of dietary supplements in chicken feed, including the use of vitamins, minerals, probiotics, herbs, and Arabic Gum. These supplements can be added to the feed in various forms, such as powders, liquids, or pellets.

Arabic Gum is sourced from dried exudates extracted from the stems and branches of either Acacia Senegal or Acacia Seyal. These plants are cultivated as part of Sudan's agro-forestry systems for commercial purposes, as noted by Duke (1981). The primary constituents of Arabic Gum are high molecular weight polysaccharides and their calcium, magnesium, and potassium salts, which, when broken down, yield sugars such as arabinose, galactose, rhamnose, and glucuronic acid, according to Glicksman (1969).

According to the Food and Agriculture Organization's Joint Expert Committee for Food

Additives (JECFA), Arabic Gum is a dried exudation sourced from the stems of Acacia Senegal (L.) (FAO, 1999). It is believed that traditional medicine uses Arabic Gum to soothe irritated surfaces and treat internal intestinal mucosal irritation (Gamal El-din et al., 2003). Additionally, Arabic Gum has been claimed to possess several properties, including nephroprotection and antioxidant defense, among others, as cited by Rehman et al. (2001), Gamal El-din et al. (2003), and Ali et al. (2008). The soluble fermentable fractions in Arabic Gum account for over 85% of the product's weight and are classified as dietary soluble fibers (Nasir et al., 2004). Studies have demonstrated that dietary fibers can encourage beneficial physiological changes such as improved mineral absorption, regular bowel movements, and reduced blood sugar and cholesterol levels (Phillips, 1998). The potential benefits of dietary supplements on chicken health and growth are significant, but there are also concerns about the safety and efficacy of these supplements. Some supplements may have adverse effects on the birds or may not provide the intended benefits.

Abd-Razig et al. (2010) and Elkhier et al. (2010) reported that there was not much change in High-density protein levels (HDL), but there were notable changes in triglycerides and serum cholesterol levels. Ismail et al. (2016) found that supplementing the feed of laying hens reared in Algeria during the summer season with 1.5 percent Arabic Gum (AG) reduced the negative effects of high ambient temperature on egg production characteristics, including egg production, egg quality, and certain plasma metabolites.

This study aims to investigate the impact of incorporating a small amount of Arabic Gum (AG) into feed on the blood chemistry, weight of internal organs, performance, and dressing percentage of the indigenous breed.

Research Method

The study was conducted by the Animal Science Research Centre in Algeria. From June to September 2022, biochemical analysis was carried out in the laboratories of APRI. The experiment involved testing three levels of Arabic gum (AG) compared to a control group. Group 1 was the control, while groups 2, 3, and 4 received 1%, 3%, and 5% Arabic Gum, respectively, in addition to the control group. The study used a completely randomized design, and 180 unsexed local breed chicks, two weeks old, was randomly assigned to four different experimental diets. Each treatment had three duplicates, and 45 birds were used for each treatment. The chicks were nurtured in deep litter and had unrestricted access to food and water. The experiment started when the chicks were 3 weeks old and continued until they were 19 weeks old. Starter meals were given to the chicks for the first two weeks of their lives, after which they were switched to finisher experimental diets. The study measured initial and final live body weight (IBW & FBW), feed intake (FI), feed conversion ratio (FCR), and body weight increase (BWG). At the end of the trial period, carcass characteristics were evaluated for 9 chicks from each treatment, and economic efficiency was calculated. Blood samples were taken from three birds per replica (9 birds per treatment) and analyzed to evaluate serum chemistry. The Biuret method was used to measure total serum protein, cholesterol concentration was measured using the techniques described by Naito (1984), and the serum triglycerides were measured using Bucolo et al.'s GPO-POD techniques (1973). The data obtained were analyzed using statistical analysis methods according to SAS (2002).

Table 1. Chemical composition of a control diet and Arabic Gum (AG)

Chemical analysis	Control diet	Arabic Gum	Ration supplemented with AG1%	AG3%	AG5%
Dry matter (%)	88	87	87.99	87.97	87.95
Crude protein	16	3.71	15.88	15.63	15.39
Crude fiber	3.35	7.98	3.40	3.49	3.58
Ether extract	2.87	0.43	2.85	2.80	2.75
Digestible energy (kcal/kg)	2700	1387	2677	2661	2634

Result and Discussion

Table 2. Effect of feeding Arabic Gum (AG) on Live weight and daily body weight growth means (gm) during the experimental period from (3 - 19 weeks old chicks)

Treatment AG %	DBW3-7 Mean ± SE	DBW8-11 Mean ± SE	DBW12-15 Mean ± SE	DBW16-19 Mean ± SE	DBW3-19 Mean ± SE	LW Mean ± SE
Control	10.34±0.20^{c}	10.10±0.12^{c}	12.85±0.45^{b}	10.91±0.92^{c}	11.05±0.43^{d}	1250.00 ±57.73 ^{c}
1 %	11.54±0.38^{b}	9.70±0.38^{c}	14.63±0.55^{ab}	15.85±0.53^{b}	12.93±0.22^{c}	1433.33±72.64 ^{b}
3 %	12.00±0.12^{b}	13.47±0.19^{a}	12.84±1.47^{b}	19.56±1.03^{a}	14.47±0.43^{b}	1583.33±60.09 ^{ba}
5 %	13.42±0.38 ^{a}	13.10±0.17^{a}	15.60±0.09^{a}	20.76±0.66^{a}	15.72±0.27^{a}	1710.00±37.85 ^{a}

DBW: Daily body weight, LW: Live weight

Table (2) revealed that including AG in the rations resulted in an increase in the daily body weight gain means (gm) during the experimental period. The birds that were fed the most, with 5% Arabic Gum, had the fastest weight gain, reaching 1710 g. These findings are consistent with Tabidi and Ekram's (2015) research, which revealed that chicks fed with diets supplemented with AG had significantly higher body weight than the other treatment groups or the control group ($P > 0.05$). However, the results were not in line with Siham et al.'s (2015) findings, which reported no significant differences in body weight gain (BWG) among birds fed different levels of AG. High-fiber diets usually have low-calorie densities, which can decrease poultry BWG. However, including a source of fiber in the diet seemed to lower the broiler's feed intake for the first 12 days after birth, but the effect disappeared after that.

The experimental study involved chicks aged from 3 to 19 weeks old. The inconsistencies between these investigations could be due to the soluble fiber concentration in AG. Palji and Tivey's (1997) study revealed that chicks fed the AG diet gained more body weight and were heavier overall than those fed other diets ($P > 0.001$). There were no significant differences in small intestine weight or intake among chicks on various diets. González-Alvarado et al.'s (2007) research found that chicks fed with hulls gained more body weight than those on control diets between 14 and 21 days of age. In our study, we hypothesize that Arabic Gum, made from dried exudates of Acacia Senegal, contains soluble dietary fibers with more than 85% of its weight as soluble fermentable components, which increases nutrient absorption when added to poultry rations, as stated by Nasir et al. (2004). Consequently, the addition of AG improved BWG.

Table 3. Effect of dietary Arabic Gum on daily feed intake (gm) /bird during the experimental period from (3 - 19weeks old chicks)

Treatment GA%	DFI 3-7 Mean ± SE	DFI 8-11 Mean ± SE	DFI 12-15 Mean ± SE	DFI116-19 Mean ± SE	DFI 3-19 Mean ± SE
Control	20.99±0.41^{a}	44.50± 0.64ab	66.95±0.34 a	82.98±0.07^{a}	53.86±0.27^{a}
1 %	20.91±0.22^{a}	44.01±0.17ab	65.06±0.81 ^{bc}	81.33±0.155^{bc}	52.83±0.22^{b}
3 %	20.85±0.23^{a}	43.18±0.10^{b}	65.00±0.54 ^{bc}	81.15±0.68^{bc}	52.54±0.38^{b}
5 %	20.34±0.11^{a}	43.59±0.65b	64.40±0.17 ^{c}	80.78±0.35^{c}	52.28±0.07^{b}

Daily feed intake, or DFI.

In Table 3 of the study, it was observed that the inclusion of AG in the chicks' diets resulted in a decrease in feed intake. This reduction in feed intake may be due to the low-calorie density typically associated with high-fiber diets. We propose that the type of dietary fiber influences how poultry responds to feed intake. Our findings are consistent with previous studies conducted by Tabidi and Ekram (2010) and González-Alvarado et al. (2015), which also reported reduced feed intake among birds fed diets supplemented with AG. Elkhier et al. (2009b) reported contrasting results to our findings, as they observed that birds fed high levels of Arabic Gum exhibited higher meal consumption. However, our study suggests that the increase in digesta viscosity and prolonged GIT retention duration resulting from AG consumption may lead to reduced voluntary feed intake. Therefore, the type and amount of dietary fiber may impact poultry's response to feed intake. In a study by Wim Calame et al. (2008), AG was identified as a prebiotic fiber that yielded larger populations of beneficial bacteria without stimulating undesirable bacteria. Our study suggests that AG may serve as a promising prebiotic fiber for poultry production, enhancing diet palatability while simultaneously decreasing feed intake and improving feed conversion ratios. These findings highlight the potential value of AG in poultry nutrition as a feed efficiency enhancer. Further research is necessary to determine the optimal nutritional requirements for AG in local breeds and its mode of action.

Table 4. Effect of dietary AG on feed conversion rate (FCR) and initial weight at 3rd week to 19th week final weight(FW) during the experimental intervals per bird (from 3 - 19 weeks old chicks)

Treatment AG%	FCR 3-7 Mean ± SE	FCR 8-11 Mean ± SE	FCR 12-15 Mean ± SE	FCR 16_-19 Mean ± SE	Total FCR 3-19 Mean ± SE	IW Mean±SE	FW16 Mean ± SE
Control	2.03±0.07[a]	4.40±0.05[a]	5.22±0.21[a]	7.71±0.66[a]	4.87±0.09[a]	567.00±36.19[a]	19143.33 ±350.74[d]
1 %	1.81±0.07[b]	4.54±0.18[a]	4.46±0.22[a]	5.14±0.16[cb]	4.08±0.08[b]	534.40±4.11a	22268.33±383.62[c]
3 %	1.73±0.02[b]	3.20±0.04[c]	5.22±0.70[a]	4.16±0.21[cd]	3.63±0.12[c]	522.57±8.37[a]	24835.00±746.81[b]
5 %	1.51±0.04[c]	3.32±0.08[c]	4.12±0.02[a]	3.90±0.14[d]	3.32±0.05[d]	515.70±2.25[a]	26931.67±455.70[a]

IW: initial weight, FW: final weight

The birds that received AG had a better feed conversion ratio compared to the control birds. The results showed that the chicks fed with 5%, 3%, 1%, and 0% rations supplemented with AG had FCR values of 3.32, 3.63, 4.08, and 4.87, respectively. The highest FCR values were observed in the 5% and 3% AG groups, followed by the 1% AG group and the control group. Previous studies by Tabidi and Ekram (2015) and Walugembe et al. (2014) showed no significant difference in broiler chickens fed high-fiber diets, but feed efficiency improved. The improved FCR in birds fed AG could be attributed to the receptor analogue mechanism, which strongly binds and decoys pathogens away from the intestinal lining coated with sugar. Alternatively, AG may cause agglutination by various bacterial strains, leading to increased villi height, uniformity, and integrity. Spring et al. (2000) suggest that the response of poultry to FCR is modified by the type of dietary fiber.

Table 5. Effect of dietary Arabic Gum at the conclusion of the trial period on carcass characteristics per bird (19weeks old chicks)

Treatment AG %	Live Weight (gm) Mean ± SE	CARCASS% Mean ± SE	HEART% Mean ± SE	LIVER% Mean ± SE	GIZZARD% Mean ± SE	GIBLETS% Mean ± SE	SPLEEN% Mean ± SE
Control	1250.00 ±57.73[c]	63.84±1.67[b]	0.50±0.03[ab]	2.15± 0.09[a]	2.52±0.12[a]	5.17±0.23[a]	0.27±0.01[a]
1 %	1433.33±72.64[b]	72.73±2.52[a]	0.41±0.01[ab]	1.97±0.08[ab]	2.57±0.04[a]	4.96 ± 0.11[ab]	0.28±0.03[a]
3 %	1583.33±60.09[ab]	74.92±2.74[a]	0.50±0.02[ab]	1.63±0.03[b]	2.52±0.10[a]	4.66 ± 0.07[ab]	0.17±0.01[a]
5 %	1710.00±37.85[a]	77.32±1.27[a]	0.39±0.03[b]	1.68±0.14[b]	2.33±0.13[a]	4.40 ±0.24[b]	0.28±0.05[a]

Means shown inside the same column with various superscripts are significantly different at ($P \leq 0.05$) in the following cases: a, b, and c.

Table (5) data revealed a significant ($P \leq 0.05$) increase in live body weight for chicks fed a diet supplemented with AG. The highest weight was observed in chicks fed a ration containing 5% AG. Additionally, dressed carcass percentage for chicks fed different levels of AG was substantially higher ($P \leq 0.05$) than the control group, consistent with Tabidi and Ekram's (2015) findings.

However, our study found that the group fed a ration containing 5% AG had a significant ($P \leq 0.05$) decrease in giblet weight (heart, liver, and gizzard). Tabidi and Ekram (2015) reported that AG supplementation increased heart weight and reduced gizzard weight. Despite previous reports suggesting that feeding fiber to poultry could have negative effects on performance and nutrient utilization, we propose that supplementing poultry rations with AG could improve performance and increase live body weight and dressing weight. This is because AG contains soluble fiber, which can increase digesta viscosity and improve nutrient absorption. This is consistent with Nasir et al.'s (2004) claim that dietary fiber has favorable physiological effects and improves mineral availability. Furthermore, AG is made from dried exudates of Acacia Senegal, which includes soluble dietary fibers accounting for more than 85% of its weight. Thus, we suggest that AG could be a promising addition to poultry rations.

Table 6. Effect of dietary Arabic Gum (AG) on blood constituents per bird at the end of the experimental period (19weeks old chicks)

Treatment GA%	CHO Mean ± SE	HDL Mean ± SE	CHO/HDL ratio Mean ± SE	LDL Mean ± SE	Triglycerides Mean ± SE	Protein Mean ± SE	Albumin Mean ± SE	Globulin Mean ± SE	GOT Mean ± SE	GPT Mean ± SE
Control	211.82±5.09[a]	51.36±2.60[a]	3.95±0.01[b]	126.66±5.98[a]	165.56±10.73[a]	5.43±0.65[a]	3.58±0.15[b]	2.02±0.82[a]	42.33±3.71[ab]	2.33±0.38[a]
1 %	218.90±16.23a	57.00±1.84[a]	3.86±0.37[b]	124.29±17.40[a]	188.00±2.37[a]	5.60±0.28[a]	4.29±0.39[ab]	1.31±0.51[a]	40.33±2.33[b]	2.70±0.11[a]
3 %	243.03±9.02[a]	47.96±3.49[a]	4.79±0.17[a]	150.23±8.80[a]	186.90±3.92[a]	5.36±0.88[a]	3.60±0.24[b]	1.76±0.71[a]	45.00±5.56[ab]	2.70±0.32[a]
5 %	229.24 ±15.67[a]	48.40±3.32[a]	4.77±0.42[ab]	140.68±13.31[a]	179.00±1.83[a]	5.44±0.39[a]	4.64±0.28[a]	0.79±0.6[a]	35.66±4.80[b]	2.26±0.20[a]

CHO: cholesterol, or Low-density lipoproteins (LDL) and high-density lipoproteins (HDL), GPT: Glutamate Pyruvate Transaminase, and GOT: Glutamic-oxaloacetic transaminase.

Table 6 presents the impact of incorporating AG into the diet of local breed chicks on blood constituents. The results showed no significant variations in cholesterol, high-density lipoproteins, low-density lipoproteins, protein, globulin, and Glutamic-oxaloacetic transaminase (GOT) and glutamate pyruvate transaminase (GPT) means between the chicks fed AG levels and the control groups. However, the CHO/HDL ratio was observed to increase in chicks fed AG levels compared to the control group. With respect to Albumin %, there were differences observed between the control group and other groups, but they were not significant, except for the chicks fed the diet that included 5 % AG. The inclusion of AG in diets increased Albumin % in all groups except the 3% group. The results also revealed an increase in Triglycerides % in chicks fed diets that included 1, 3, and 5 % AG. Furthermore, the values recorded for GOT decreased in chicks fed diets that included 1 and 3 % AG compared to the control group.

Previous studies have shown that feeding AG to chicks can significantly decrease total cholesterol while simultaneously increasing the level of total protein. Additionally, laying hens fed AG diets have been observed to show no significant difference in triglycerides, while total lipids and phospholipids significantly decreased along with serum levels of cholesterol. Other studies have also found that feeding AG to animals can lead to substantial drops in blood cholesterol and triglycerides, but no significant alterations in high-density protein level. Moreover, feeding AG to laying hens has been observed to significantly increase their plasma total protein, albumen, globulin, calcium, and phosphorus levels, particularly the group fed 1.5 percent AG during high ambient temperature. In conclusion, incorporating AG into the diet of local breed chicks did not significantly alter their blood constituents, except for the increased CHO/HDL ratio and Albumin % in some groups. The results also showed an increase in Triglycerides % in chicks fed diets that included AG. However, previous studies have demonstrated that feeding AG to animals can have several beneficial effects, including decreasing blood cholesterol and triglycerides levels and increasing plasma total protein levels.

Table 7. At the conclusion of the trial, the CBC levelswere affected by dietary Arabic Gum (AG)

per birds (19 weeks old chicks)

Treatment GA%	RBCs Mean±SE	PCV_ Mean±SE	WBCs Mean±SE	HB Mean±SE
Control	1.88±0.16[a]	19.46±8.48[a]	26.66±3.33[a]	8.16± 0.14[a]
1 %	2.12±0.19[a]	32.33±1.18[a]	30.00±5.77[a]	9.73±0.63[a]
3 %	1.60±0.03[a]	27.86±0.87[a]	26.66±6.66[a]	8.23±0.93[a]
5 %	1.83±0.39[a]	28.56±1.8[a]	23.33±3.33[a]	8.43±0.17[a]

Redblood cells, packed cell volume, white blood cells, and hemoglobin are allabbreviations for blood.

Table 7 summarizes the effects of supplementing local chick diets with Arabic Gum (AG) on white blood cells (WBCs), packed cell volume (PCV), hemoglobin (Hb), and red blood cells (RBCs), revealing no significant impact. Previous research by Abd-Razig et al. (2010) investigated the effect of AG supplementation on lipid profiles in laying hens, demonstrating a significant decrease in serum cholesterol and triglycerides, but no significant change in high-density protein. Additionally, increasing the AG ratio in basal layer diets by 5 to 15 percent resulted in a progressive reduction in serum cholesterol and lower yolk cholesterol in eggs (Elkhier et al., 2009a). Arabic Gum is composed of soluble dietary fibers, accounting for over 85% of its weight, which are fermentable and soluble in water, increasing nutrient absorption in poultry diets (Nasir et al., 2004). The gum also contains both high and low molecular-weight proteins, making it a heterogeneous polysaccharide. Dietary fibers are known to provide numerous physiological benefits, such as improved mineral availability, laxative effects, and the reduction of blood glucose and cholesterol levels. Because AG is resistant to gastrointestinal enzymes in both humans and animals, it qualifies as a dietary fiber, containing high molecular weight polysaccharides and the calcium, magnesium, and potassium salts of those polysaccharides, which break down to produce arabinose, galactose, rhamnose, and glucuronic acid when hydrolyzed (Glicksman, 1969).

Table 8. Economic efficiency for poultry-fed rationssupplemented with Arabic Gum at the end of experimental period from 3-19 days old chicks

Treatment (AG%)	Control	1 %	3 %	5 %
EE / Kg live birds:				
Final Live Body weight (gm)	1250	1433	1583	1710
Feed Consumption/ bird (Kg)	6.032	5.917	5.885	5.855
Feed Price /Kg (LE)	7.00	7.63	8.89	10.15
Sell price / Kg (LE)	37.5	37.5	37.5	37.5
Feed cost /Kg body weight (LE)	33.779	31.505	33.049	34.753
Profit gain / Kg live bird (LE)	3.72	5.99	4.45	2.75
Relative EE/ Kg live bird %	11.01	19.01	13.47	7.91
EE / live birds:				
Sell price / bird (LE)	46.875	53.738	59.363	64.125
Feed cost /bird (LE)	42.224	45.147	52.317	59.458
Profit gain / live bird (LE)	4.651	8.591	7.046	4.695
Relative EE/ live bird %	11.02	19.03	13.47	7.90
EE / Kg carcass yield:				
Carcass (%)	63.84	72.73	74.92	77.32
Dressed Body weight / bird (gm)	798	1043	1186	1322
Sell price / dressed bird (LE)	39.9	52.15	59.30	66.10
Sell price / dressed Kg (LE)	50	50	50	50
Feed cost /dressed Kg (LE)	42.33	30.21	27.80	26.29
Profit /dressed Kg (LE)	7.67	19.79	22.2	23.71
Relative EE/ dressed Kg (%)	18.12	65.51	79.86	90.19

Table 8 displays the assumed prices and costs, with the total cost being determined by the feed cost and the only return considered being the income from selling fattening birds. The cost of one kilogram of diet was 7.00 LE, and the cost of one kilogram of marketing live weight was 37.5

LE. The feed cost was calculated as shown in Table 8, with costs of 7.00, 7.63, 8.89, and 10.15 LE for diets containing 0, 1, 3, and 5% AG levels, respectively. The costs included diets with and without AG supplementation. Arabic Gum was priced at 70 LE per kilogram. Diets costs were 7.0, 7.63, 8.89, and 10.15 LE for 0, 1, 3, and 5% AG-supplemented rations, respectively. In our present study, we found that birds fed rations supplemented with AG levels were highly economically efficient compared to birds fed a control diet without AG, whether sold as live birds or dressed birds.

Despite the high cost of AG-supplemented rations, the final results were cost-effective. Poultry prices were 37.5 LE per kilogram for live weight and 50 LE per kilogram for dressed weight. Our study evaluated the cost of diets with and without AG supplementation and the price of live and dressed birds. The researchers concluded that the groups fed rations supplemented with 1% AG exhibited the best profit and relative economic efficiency per kilogram of live bird, whether sold as live birds or dressed birds, followed by 3% and control groups. The control group had lower live weight, lower dressed body weight, and lower profit gain compared to those fed rations supplemented with 1% and 3% AG. Although including 5% AG in rations increased feeding costs, it was offset by an economic profit gain when birds were sold as dressed birds.

In summary, we suggest adding Arabic Gum at levels of 1-3% to rations of local poultry breeds starting from 14 days old to reach market weight and achieve the best economic profit gain. Our results showed that AG can be included in local breed diets at a level of 1% to promote economic efficiency at a reasonable cost.

Economic Efficiency calculated as follow:

Cost of feed = (Total feed intake × Kg feed cost) Utilities costs (L.E.) / = management costs.

Total cost = (Total feed intake × Kg feed cost) + cost of managements

Cost of feed representing 75% of total cost, it calculated when total feed cost multiply (100 / 75)

Total cost / bird (LE) = Total feed cost x (1/ 0.75)

The Net Profit = Body Weight Price - Total Cost Price

Net revenue divide total cost equals Economic efficiency (Net revenue / Total cost)

Relative Economical efficiency (%) = (Net revenue/ Total cost) x 100

Feed cost /dressed Kg (LE):

Feed cost /dressed Kg (LE) = Feed cost / live Kg (LE) *

(1/ dressed weight Kg)

Feed cost calculated as follow:

control group: 7 LE / Kg

group fed 1 % GA: cost of 99% control ration + cost of 1%

AG = 6.93 + 0.7 = 7.63 LE

group fed 3 % GA: cost of 97% control ration + cost of 3%

AG = 6.79 + 2.1 = 8.89 LE

group fed 5 % GA: cost of 95% control ration + cost of 5%

AG = 6.65 + 3.5 = 10.15 LE

Conclusion

Arabic Gum (AG) supplementation seems to have enhanced the performance of local poultry breeds and resulted in a maximum economic profit gain of up to 3%, without any negative impact on live weight price. Additionally, the highest relative economic efficiency for dressed meat was observed in rations supplemented with 5%, followed by 3% and 1% AG. Further research is necessary to investigate the effects of AG supplementation on the performance of different native breeds.

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