

THE EFFECT OF DIFFERENT LEVELS OF OLIVE PULP ON THE FEED INTAKE AND DIGESTIBILITY OF BROILERS

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Olive cake is one of the most available by-products of local farming in Palestine, estimated at 36,000 tons/year (Ministry of Agriculture 1999). This amount is of great importance as a potential feed component when used at certain levels in livestock rations. The feeding costs in Palestine make up more than 70% of the total production costs in any livestock operation.

Therefore, it is highly recommended to incorporate raw materials and farm by-products in ration formulation as possible (Shqueir and Qawasmi, 1994).

The objective of this research is to investigate the effect of feeding different levels of olive pulp as part of finishing rations on the digestibility parameters of broiler chicks.

A total of 18 birds at 22 days of age were used in the digestion trial. Birds were divided into three groups, and each bird in the group was a replicate.

Birds were kept in their cages for 3 days of adaptation to the new environment and rations. This period was followed by a 6-day total collection period. . Samples from each ration were collected and stored for later analysis. During the collection period, feed intake, fecal output and feed refused were weighed and sampled for later analysis.

The analysis of olive pulp samples showed a content of 10.6% crude protein, 12% crude fat, 26% crude fiber, 24% acid detergent lignin and 33% acid detergent fiber. These results agree with those reported by Rabayaa (2000), that the crude fat content was lower.

The dry matter consumption by broilers during the experiment averaged 86.5, 91.1 and 93.4g for the control, 3% and the 6% olive pulp groups,

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respectively. The higher level of olive pulp fed to broilers caused higher feed intake in the course of the experiment but it was not significant. This finding is in agreement with others reported by several investigators (e.g. Rabayaa, 2000). The broiler dry matter intake increased significantly when olive cake was fed at levels higher than 7.5% (Rabayaa, 2000). The increase in feed intake is associated with an increase of fiber which might have an effect on the rate of passing of feed in the gastrointestinal tract.

The average daily protein intake was 16.6, 17.0, and 18.8 g/day for the experimental groups, control, 3%, and 6% respectively (Table 1), The variation in protein intake tended to be not significant and was similar to the recommended levels (NRC, 1994). The intake of protein increased with the increased feed intake.

Broilers receiving the olive pulp had a higher ($p < 0.05$) intake of fiber compared to the control chicks. The level of intake was 1.0, 1.9 and 2.1 g/day for the control, 3% and 6% groups, respectively (Table 1). The increase in fiber intake was associated with incorporation of olive pulp. Similar results were reported by (Rabayaa, 2000) when broiler chicks were fed different levels of olive pulp, however, levels of olive pulp higher than 10% caused significant decline in dry matter and fiber intake due to depression in appetite (El Moghazi and El Boushy, 1982).

As shown in (Table 1), the level of fat intake averaged 5.7, 6.2 and 6.3 g/day for the experimental groups control, 3% and 6% olive groups, respectively. The intake of fat increased with the increased level of olive pulp but that increase was not significant. This result agrees with those reported¹ by (Rabayaa, 2000). However, the total energy content of experimental rations used in this experiment was nearly the same.

The digestibility of dry matter ranged from 69% to 72% (Table 2). The broiler chicks consuming 3% olive pulp had the highest dry matter digestibility (72%),' while chicks consuming 6% had 70% dry matter digestibility compared to the dry matter digestibility of the control chicks (69%). Incorporation of olive pulp at the rate of 3% increased digestibility of dry matter by 4%. The level of fiber in diets consumed might have enhanced the digestibility of dry matter. Fiber showed to be responsible for activation of gastrointestinal tissues and enzyme system thus 'improving the digestibility of dry matter and its components of nutrients (Abo Omar and Gavoret, 1994). Similar apparent retention of dry matter was reported by

Onifade and Babatunde (1997) in which high level of fiber was fed to broiler chicks from 7 to 35 days of age.

Olive pulp caused an increase in crude protein digestibility (Table 2). The chicks, which were not fed olive pulp, had the lowest ($p < 0.05$) crude protein digestibility compared to the other treatment groups. The digestibility levels ranged between 73 and 78.6% and were higher than those reported by a previous study on broilers fed high levels of fiber (Onifade and Babatunde, 1997). Again, the increasing level of fiber associated with the feeding of olive pulp was responsible for the increase in the digestibility of protein.

The digestibility of crude fiber was not affected significantly by level of olive pulp in diets (Table 2). However, the digestibility of crude fiber was higher in diets with highest level of olive pulp. The average digestibilities were 29.0, 30.0 and 30% for the control, 3% and 6% olive pulp respectively. Similar higher fiber digestibility levels were observed by Onifade and Babatunde (1997).

The feeding of olive pulp had no effect on crude fat digestibility (Table 2). The digestibility of fat slightly increased with the level of olive pulp, from 77.6% for control to 78.3% for 3% olive pulp to 79% for 6% olive pulp.

As shown in (Table 2), the digestibility of nitrogen free extract (NFE) ranged from 80 to 84%. Rations with 6% olive pulp had the highest NFE digestibility (84%) followed by rations with 3% olive pulp (83%) compared with the control diet, which had 80% NFE digestibility. Similar results were reported when high fiber diets fed to broilers (Onifade and Babatunde, 1997).

Table 1. Total dry matter and nutrient intake by broilers in the experiment (gram/day)

Item	Control	OP (3.0%)	OP (6%)
Dry matter	86.5	91.1	93.4
Crude protein	16.6	17.0	18.8
Crude fiber	1.0c	1.9b	2.1a
Crude fat	5.7	6.2	6.0

OP: Olive Pulp

Table 2. Digestibility of dry matter and nutrients by boilers in the experiment (gram/day)

Item	Control	OP (3.0%)	OP (6%)
Dry matter	89.5	90.4	<i>f</i> 91.0
Crude protein	84.4b	86.7a	87.6a
Crude fiber	7.0	8.0	9.0
Crude fat	87.5	88.3	89.0

Average values in column control followed by. different letter differ significantly at 5% level.

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