

CONTENTS

SUBJECTS	Page No.
1.INTRODUCTION	1
2.REVIEW OF LITERATURE	3
2.1. lipids and some tested oils	3
2.2. Growth performance	8
2.2.1.Live body weight and body weight gain	8
2.2.2.Feed consumption and feed conversion	10
2.3. Carcass traits	12
2.4. Some blood constitutes	14
3.MATERIALS AND METHODS	16
3.1 Experiment (I)	16
3.2 Experiment (II)	20
3.3 Experiment (III)	23
3.4 Management	26
3.5 Measurements	26
3.5.1 Live weight	26
3.5.2 Live body weight gain	27
3.5.3 Feed consumption	27
3.5.4 Feed conversion	27
3.5.5 Economic efficiency (E.E)	27
3.5.6 Slaughter test	28
3.5.7 Blood sampling	28
3.6. Determination of total lipids and Total cholesterol	28
3.7. Determination of fatty acids	29
3.8. Statistical analysis	32
4.RESULTS AND DISCUSSION	33
4.1. First Experiment	33
4.1.1. Growth performance	33

SUBJECTS	Page No.
4.1.1.1 Body weight	33
4.1.1.2 Body weight gain	36
4.1.1.3 Feed consumption	39
4.1.1.4 Feed conversion	42
4.1.2. Carcass characteristics	45
4.1.3. Some blood constituents	48
4.1.4. Economical efficiency for feed	50
4.2. Second Experiment	52
4.2.1. Growth performance	52
4.2.1.1 Body weight	52
4.2.1.2 Body weight gain	54
4.2.1.3 Feed consumption	56
4.2.1.4 Feed conversion	58
4.2.2. Carcass characteristics	60
4.2.3. Some blood constituents	62
4.2.4. Economical efficiency for feed	64
4.3. Third Experiment	66
4.3.1. Growth performance	66
4.3.1.1 Body weight	66
4.3.1.2 Body weight gain	68
4.3.1.3 Feed consumption	70
4.3.1.4 Feed conversion	72
4.3.2. Carcass characteristics	74
4.3.3. Some blood constituents	76
4.3.4. Economical efficiency for feed	78
5.Summary	80
6.References	87
Arabic summary	-

5. SUMMARY

Three experiments were conducted to evaluate influence of adding glycerol on utilization of free fatty acids or acidulated oils in broiler diets. Chicks were housed in open system, gas heated batteries and kept under similar conditions of management during an experimental period, which lasted until 42 days of age.

***First Experiment:**

A 4×2 factorial experiment was carried out to study the effect of four sources of fat (soybean oil, free fatty acids, glycerol, and acidulated oils) and two levels of fats (2% and 4%) on growth performance, carcass traits, some blood constituents, and economic efficiency for feed of broilers. A total number of 240 unsexed four-day-old Arbor Acres broiler chicks were individually weighted, wing banded, assigned to 8 treatments of 30 chicks each in three replicates (10 chicks per replicate). The average four-day-old weight was 75 gm. All diets were formulated using linear programming to be iso-nitrogenous and iso-caloric, containing 23% Crude protein and 3000 kcal ME/kg (starter) and 20% Crude protein and 3100 kcal ME/kg (grower).

The results obtained could be summarized as follows:

1. Growth performance:

- Chicks fed diets supplemented with soybean oil recorded significantly the heaviest body weight compared with the other treatments at 6 weeks of age. However, chicks fed diets supplemented with acidulated oils were recorded significantly the lightest body weight at 6 weeks of age.

- Results presented showed that body weight of broilers fed diets supplemented by 4 % fat was significantly ($P \leq 0.01$) heavier than of broilers fed diets supplemented by 2 % fat at 3 and 6 weeks of age.
- Regarding the interaction between source and level of fat , the heaviest body weight was recorded for chicks fed diet supplemented with 4% soybean oil or free fatty acids, while the lightest one was recorded for those fed diets supplemented with 2% acidulated oils .
- Chicks fed diets supplemented with glycerol recorded significantly the highest body weight gain compared with the other treatments at 3-6 weeks of age. However, broilers fed diets supplemented with acidulated oils were recorded significantly the lowest body weight gain at 4-6 weeks of age.
- Results showed that body weight gain of broilers fed diets supplemented by 4 % fat was significantly higher than those of broilers fed diets supplemented by 2 % fat at all experiment period .
- Regarding the interaction between source and level of fat, the highest body weight gain was recorded for chicks fed diets supplemented with 4% soybean , while the lowest one was recorded for chicks fed diets supplemented with 2% acidulated oils .
- Chicks fed diets supplemented with free fatty acids recorded the highest Feed consumption at 3-6 and 0-6 weeks of age, while the lowest Feed consumption was recorded with chicks fed diets supplemented with glycerol at experiment period.

- Increasing dietary fat level from 2 to 4% significantly ($P \leq 0.01$) reduced Feed consumption at 0-3 weeks and increased Feed consumption at 3-6 and 0-6 weeks of age.
- Regarding the interaction between dietary fat sources and dietary fat levels, the highest feed consumption was recorded for broilers fed diets supplemented with 4% free fatty acids, while the lowest one was recorded for broilers fed diets supplemented with 2% glycerol at 3-6 and 0-6 weeks of age.
- Chicks fed diets supplemented with glycerol recorded significantly the best Feed consumption compared with the other treatments at 3 and 6 weeks of age. However, chicks fed diets supplemented with either acidulated oils or free fatty acids recorded the worst Feed conversion.
- Chicks fed diets supplemented with 4% oil improved feed conversion at 0-3 and 0-6 weeks of age.
- Regarding the interaction between dietary fat sources and dietary fat levels, the best feed conversion was recorded for broilers fed diets supplemented with 2% glycerol, while the worst one was recorded for broilers fed diets supplemented with 2% free fatty acids at 0-6 weeks of age.

2- Carcass characteristics:

- Chicks fed diets supplemented with soybean oil significantly ($P \leq 0.05$) recorded the highest dressing % (77.13%) compared with the other treatments. While, chicks fed diets supplemented with either free fatty acids or acidulated oil significantly ($P \leq 0.05$) recorded the lowest value of dressing % (75.05%) and (75.00%) respectively, compared with the other treatments.

- Insignificant interaction between dietary fat sources and dietary fat levels were observed for carcass characteristics.

3- Some blood constituents:

- Results indicate insignificant effect on total lipids or cholesterol concentration due to using either dietary sources or levels of fat and glycerol in broiler diets and the interaction between them.

4- Economical efficiency for feed:

- The relative economical efficiency for feed increased by 1.5% and 1.6% for chicks fed diets containing acidulated oil and those fed diets containing free fatty acids compared with the control group (fed diets containing soybean oil), respectively.
- Regarding the fat levels, chicks fed diets containing 4% fat recorded higher relative economical efficiency for feed compared with those fed diets containing 2% fat.

***Second Experiment:**

A total number of 180 unsexed four-days old, Arbor Acres broiler chicks were randomly assigned to 6 treatments in three replicates (4% glycerol , 4% free fatty acids, 3% free fatty acids + 1% glycerol, 2% free fatty acids + 2% glycerol, 1 % free fatty acids + 3% glycerol and 4% glycerol in addition to diet containing 4% soybean (control)). All diets were formulated using linear programming to be iso-nitrogenous and iso-caloric, containing 23% Crude protein and 3050 kcal ME/kg (starter) and 20% Crude protein and 3100 kcal ME/kg (grower).

The results obtained could be summarized as follows:

1. Growth performance:

- Results indicated that adding 1% glycerol to 3% free fatty acids in broiler diets had no significant effect on body weight at 0-3, 3-6 and 0-6 weeks of age.
- Results indicated that adding 2% glycerol to 2% free fatty acids in broiler diets had no significant effect on body weight gain at 3-6 and 0-6 weeks of age.
- Regarding to the results presented it was obvious that adding glycerol to free fatty acids in broiler diets significantly decreased feed consumption at all ages interaction studied .
- Results indicated that adding 1% glycerol to broiler diets containing 3% free fatty acids significantly ($P \leq 0.01$) improved feed conversion compared with those fed free fatty acids at 3-6 and 0-6 weeks of age.

2. Carcass characteristics:

- Results indicated that adding dietary glycerol to free fatty acids in broiler diets at 6 weeks had no significant effect on carcass characteristics.

3. Some blood constituents:

- Results indicated that adding dietary glycerol to free fatty acids in broiler diets had no significant on total lipids or cholesterol.

4. Economical efficiency for feed:

- Results in indicated that adding dietary glycerol by 1% or 2% to free fatty acids in broiler diets improved the relative economic

efficiency for feed by 26 % and 14.106 % over the diet supplemented with soybean oil 4 % in broiler diets.

***Third Experiment:**

A total number of 180 unsexed four-days old, Arbor Acres broiler chicks were randomly assigned to 6 treatments (4% acidulated oil, 3% acidulated oil + 1% glycerol, 2% acidulated oil + 2% glycerol, 1 % acidulated oil + 3% glycerol and 4% glycerol in addition to diets containing 4% soybean (control)). All diets were formulated using linear programming to be iso-nitrogenous and iso-caloric, containing 23% Crude protein and 3000 kcal ME/kg (starter) and 20% Crude protein and 3100 kcal ME/kg (grower).

The results obtained could be summarized as follows:

1. Growth performance:

- Results indicated that adding dietary glycerol to acidulated oil in broiler diets at 3 and 6 weeks had no adverse effect on body weight at 3 and 6 weeks of age.
- Regarding to the results it was obvious to know that using acidulated oils to glycerol in broiler diets didn't decrease body weight at all ages.
- Results indicated that adding dietary glycerol to acidulated oil in broiler diets at 3 and 6 weeks had no adverse effect on body weight gain at 0-3, 3-6 and 0-6 weeks of age.
- Results in indicated that adding acidulated oils to glycerol in broiler diets was significant by decrease feed consumption at 0-6 weeks of age.

- Regarding feed conversion, results indicated that adding glycerol to diets containing acidulated oils significantly ($P \leq 0.01$) improved feed conversion compared with those fed acidulated oil at all age intervals studied.

2. Carcass characteristics:

- Results presented indicated that adding dietary acidulated oil to glycerol in broiler diets had no significant effect on carcass characteristics.

3. Some blood constituents:

Results indicated that adding dietary glycerol to acidulated oil in broiler diets had no significant effect on total lipids or cholesterol.

4. Economical efficiency for feed:

- Results indicated that adding dietary glycerol by (1%) or (2%) to acidulated oil in broiler diets improved economic efficiency for feed by 4.81 and 9.69% over the diet supplemented with 4% acidulated oil in broiler diets.