6- SUMMARY

The following lines summerize the various topics which were handled in the present investigation involved studying the effect of different supplementary dietary fats on fats and fat soluble vitamins of Hubbard and Arbo Acer broilers.

1- Chicken body weight, skin and abdominal fat content :

Skin and abdominal fat in two different broiler strains i.e. Hubbard and Arbor Acer were extracted using chloroform-methanol (2: 1) at 5 and 7 weeks age.

The obtained data showed that both body weight , percentage of skin and abdominal fats were affected by the type and level of dietary fat supplements in each meal and female of Hubbard chicken at 5 and 7 weeks age. It was noticed that the supplemental diet with (9 % ACS) decreased body weight in male and female but the percentage of skin and abdominal fat showed a slight increase comparing with the control diet. On the other hand, body weight, the percentage of skin and abdominal fat of broilers fed (9 % HVO) were increased than the broiler fed with control diet or fed diet supplemented with (9 % ACS).

Addition of (6 % ACS + 3% HVO) showed a decrease in both body weight and carcass weight, while the percentage of skin and abdominal fats increased than the control diet. On the other hand, when the percentage of ACS decreased and the percentage of HVO increased in supplementary dietary fat i.e.(3 % ACS + 6 % HVO) body weight and carcass weight decreased while the percentage of skin and abdominal fats were increased than the control diet.

It was noticed that addition of (9 % HVO) to the diet had better effect on broilers which increased both body wiehgt and carcass weight at 7 weeks age Also, the percentage of skin fat found to increase from 1.14 and 1.83 % to 2.79 and 3.15 % , and the abdominal fat increased from 1.52 and 1.96 % to 2.57 and 2.73% in both male and female respectively.

The addition of (9 % ACS) to the diet of both male and female of the Arbor Acer broiler chickens at 5 and 7 weeks age resulted a decrease in body weight but it caused a slight increase in the percentage of skin and abdominal fat. On the other hand, addition of (9 % HVO) found to increase body weight, carcass weight and percentage of skin and abdominal fats than broiler fed the control diet or diet supplemented with (ACS). Diet containing

(9 % ACS) affected growth rate much more than the control diet due to the presence of the toxic level of gossypol in the diet. Also, hight level of ACS in the diet (9 % ACS) or (6 % ACS + 3 % HVO) depressed fed consumption and growth rate.

The obtained data showed that, breed, sex, age and dietary fat have been found to influence body weight, carcass weight and the percentage of skin and abdominal fat. Hubbard broiler chickens was higher body weight, carcass weight, percentage of skin and abdominal fat than Arbor Acer broiler in the two ages in each males and females. Males are higher in body weight, carcass weight than females, but lower in skin and abdominal fat.

2- Physical and chemical properties of chicken fat :

The physical properties of chicken fat which included the specific gravity, refractive index and melting point were studied.

The specific gravity and refractive index of chicken fat showed that breed, sex and age did not showed a clear differences while, dietary fat caused differences in the specific gravity and the refractive index of the two different broiler strains under investigation. Both values were higher when (9 % ACS) were fed than those values in broilers fed the control diet or 9 % HVO. On the other

hand, addition of (9 % ACS) to the diet caused a decrease in chicken fat melting point.

The chemical properties of skin and abdominal fat from the two different strains under investigation were studied.

The acid value of chicken fat fed diet with ACS was nearly as that of the values in broilers fed the control diet. Addition of HVO to the diet caused a decrease in the acid value of both skin and abdominal fat. Addition of (9 % ACS) to the diet reflected an increase in the iodine value of skin and abdominal fat in each male and female broilers.

The adifferent dietary fat supplements caused widely differences in the saponification value of chicken fat under investigation.

The addition of (9 % HVO) to the diet lead to decrease the unsaponifiable matter from (1.88 and 1.89 %) in skin and abdominal fat of the control to(0.82 and 0.70 %) of the male Hubbard broilers at 7 weeks age, respectively. As well as, Arbor Acer strain showed the same trend of the unsaponifiable matter.

The peroxide value found to increase from (2.6 and 2.6) to (5.3 and 5.7) in skin and abdominal fat respectively

from male Hubbard broilers at 7 weeks age when fed diet with (9 % ACS). On the other hand, addition of (9 % HVO) to the diet decreased the peroxide value than broilers fed diet with (ACS).

3- Fatty acids composition of chicken fat :

The fat supplements (basal, ACS and HVO) differ mainly in the level of saturated and unsaturated fatty acids. Palmitic acid is higher in ACS and HVO than the control diet (23.74, 24.27 and 15.03 %, respectively). Linoleic acid is the main unsaturated fatty acid in control diet and ACS (41.31 and 47.48 %, respectively), while oleic acid was the main unsaturated fatty acid (47.01 %) in HVO.

The fatty acids composition of skin and abdominal fat from male Hubbard broilers at 7 weeks age were investigated. Results showed that the fatty acid distribution in the abdominal adipose tissues was very similar to that of the skin. Addition of (9 % ACS) to the diet showed an increase in total percent of the unsaturated fatty acids in each skin and abdominal fat than the control, (from 61.65 to 66.32 % and from 61.57 to 65.16 %, respectively). On the contrary addition of (9 % HVO) to the diet decreased total percentage of unsaturated fatty acids to reach 59.65 and 59.14 % in skin and abdominal fat respectively.

Palmitic and palmitoleic acids decreased by the addition of ACS and HVO to the diet. Palmitic acid decreased from 6.44 and 6.85 % in skin and abdominal fat to reach 4.51 and 4.08 %in broilers fed diet with 9 % ACS and 5.39 and 5.24 % in broilers fed diet with 9 % HVO. On the contrary linoleic acid increased by the addition of 9 % ACS (from 12.95 and 11.65 to 21.45 and 20.03%) while addition of 9 % HVO to the diet showed a slight increase in linoleic acid to 14.94 and 14.54 % in skin and abdominal fat respectively.

4- Chicken fat soluble vitamins :

a- Effect of dietary fat on Hubbard broilers fat soluble vitamins :

B- carotene content of skin and abdominal fat from Hubbard broilers at 7 weeks age showed a slight decrease by the addition of 9 % ACS, but a higher decrease was noticed by the addition of 9 % HVO.

Vitamins A and E concentration in skin and abdominal fat were affected by the addition of fat to the diet. Addition of 9 % ACS to the diet showed a slight decrease in the content of vitamins A and E than broiler fed the control diet. Whereas,addition of HVO found to decrease vitamins A and E contents. Also, mixing ACS and HVO showed a decrease in B-carotene content and vitamins A and E of

both skin and abdominal fat.

The obtained results showed that sex is a limiting factor for the concentration of vitamins A and E in Hubbard broiler strains. Vitamins A and E were found with higher contents in male skin and abdominal fat than in female.

b- Effect of dietary fat on Arbor Acer broilers fat soluble vitamins :

B- carotene slightly decreased in skin and abdominal fats by the addition of (9 % ACS) or the addition diet with mixing (6 % ACS + 3 % HVO) to the diet in male and female Arbor Acer broilers at 7 weeks age. Whereas, addition of (9 % HVO) to the diet showed a decrease in B-carotene content in males only.

On the other hand, vitamins A and E concentrations in skin and abdominal fat showed more pronounced decrease with different dietary fat treatments than B-carotene . Whereas, the effect of addition diet of (6 % ACS + 3 % HVO) or (3 % ACS + 6 % HVO) on vitamins A and E contents in skin and abdominal fat were nearly similar.

The obtained data showed that fat soluble vitamins were found in Hubbard broiler strain with a higher content than Arbor Acer broiler strain. Also, vitamins E content was observed in skin fat more than abdominal fat

from males and females of the different broiler strains under investigation i.e. (60.52 and 58.16 ug/ g) in males and females skin fat respectively. While the abdominal fat contained (48.19 and 46.28 ug/ g) in males and females respectively in Hubbard broiler at 7 weeks age fed with the control diet. Moreover, fat soluble vitamins tended to increase with increasing age.