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Reports suggesting a relationship between diet and blood cholesterol levels have caused people to become more concerned about the type of fat in their diets. However, there is little conclusive evidence that high blood cholesterol is indeed a major cause of heart attacks in this country. Previous work at this station has indicated that the diet has a great effect on the type of body fat in birds and that what already is highly unsaturated can be readily made still further unsaturated.

In this experiment, the effects of copper, fat and protein level on carcass composition were considered. Carcasses from the growth study reported here (A.S. Series 72-13) were made available for this work.

Adipose tissue collections were taken at slaughter from a random selection of ten birds from each treatment (five hens and five toms). Two methyl esters were made of each fat sample and these in turn were analyzed in replicate for fatty acid content by gas-liquid chromatography. The results obtained are shown in table 1. Copper supplementation in this study did not increase the extent of total fat unsaturation as had been reported for swine. There also seemed to be no consistent alterations in the individual fatty acid contents due to copper supplementation.

The 5% corn-oil additions caused a large increase in unsaturation, while the 5% yellow grease addition caused a slight decrease in body fat unsaturation. The large unsaturation increase in the corn-oil diets was due mainly to an approximate doubling of linoleic acid at the expense of the other fatty acids. Diets with the yellow grease supplement caused an increase in myristic, palmitoleic, stearic and oleic acid contents, along with a decrease in linoleic acid. Diets had no consistent effect on total fat content of muscle tissue.

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Table 1. Fat Composition as Influenced by Diet and Type of Turkey

Fatty acids	High protein + yellow grease	High protein + corn oil	Low protein	Low protein + corn oil	Low protein + yellow grease	Low protein + 120 ppm copper	Low protein + 240 ppm copper
			15 Week Hen Turkeys				
Myristic, %	1.37	0.55	0.91	0.63	1.29	0.92	0.94
Palmitic, %	21.55	16.48	20.90	16.00	19.85	23.00	23.68
Palmitoleic, %	3.56	1.29	4.02	1.65	3.27	5.32	4.35
Stearic, %	10.45	6.75	9.09	6.53	10.27	7.97	9.61
Oleic, %	39.58	27.30	36.98	27.54	38.69	37.42	34.98
Linoleic, %	21.67	47.08	26.69	45.86	24.88	24.05	25.13
Linolenic, %	2.02	1.59	1.45	1.65	1.85	1.42	1.34
% Saturation	33.37	23.78	30.90	23.16	31.41	31.89	34.23
% Unsaturation	66.83	77.26	69.14	76.70	68.59	68.21	65.80
Cooked muscle fat on a moisture-free basis, %	12.7	13.9	21.0	26.9	15.8	24.0	14.8
			24 Week Tom Turkeys				
Myristic, %	1.56	0.37	0.38	0.88	1.44	0.91	0.91
Palmitic, %	20.63	16.16	16.03	22.32	20.80	23.66	24.00
Palmitoleic, %	2.57	0.72	0.91	5.09	3.56	4.65	5.17
Stearic, %	12.98	6.45	7.06	9.44	11.23	9.46	9.59
Oleic, %	40.21	25.74	26.28	37.59	41.05	35.88	36.10
Linoleic, %	21.71	50.65	49.38	24.71	21.95	25.46	24.46
% Saturation	35.17	22.98	23.47	32.64	33.47	34.03	34.50
% Unsaturation	64.87	77.11	76.57	67.39	66.56	65.99	65.73
Cooked muscle fat on a moisture-free basis, %	16.6	23.6	18.3	17.0	17.8	15.6	18.8