TISSUE LIPID VARIATIONS UNDER LONG TERM DIETHYLSTILBESTROL ADMINISTRATION

by

Tai-Lee Ke

B.Sc., National Tsing-Hua University, Taiwan, 1970
M.S., (Chemistry), Kansas State University, 1973

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Approved by:

Major Professor: R. E. Clegg
Department of Biochemistry

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Much work has been aimed at the role of diethylstilbestrol (DES) as a carcinogen, as a growth factor in livestock and in the control of prostate carcinoma. Recent work has suggested that the variations in the serum lipid patterns brought about by the administration of large doses of DES for a limited time could be modified by high concentrations of ascorbic acid and vitamin E in the diet. This led to the question of what changes would occur, particularly in the tissues, of cockerels fed smaller doses of DES for an extended period. In the following study the effect of prolonged administration of lower levels of DES on the lipid composition of the tissues of rapidly growing and adult cockerels was investigated. Because of the large number of analyses the investigation was undertaken as a survey of the lipid variations and of the fatty acid distribution in each tissue selected. The results of this survey are to be used to plan future work, particularly work involving ascorbic acid and vitamin E.

LITERATURE REVIEW

Many investigators have studied the relationship of diet to the lipid changes in the blood serum and tissues of a variety of subjects. Only a few of these reports will be discussed. In all cases when enough lipid was added to the diet this change was reflected in the blood serum lipids, and in some cases in the tissues. Camejo et al. (4) reported early changes in the plasma lipoproteins in rabbits fed a high cholesterol diet. The cholesteryl ester of density less than 1.09 g/ml was the most prominent change. The lipoproteins of the cholesterol fed rabbits contained lipoproteins with a higher lipid-to-protein ratio. Corey et al. (7) concluded that the response of certain primate species to dietary changes in fat differed. For example, both cebus and squirrel monkeys were hypercholesterolemic on diets high in coconut oil, but only the squirrel monkeys were sensitive to extra cholesterol. Diets containing 10% safflower oil were not hypercholesterolemic. The source of plasma-free fatty acids was investigated by Heimberg (13). Human volunteers were fed either safflower oil or coconut oil, and the serum lipids compared. After safflower oil feeding the 18:2 in the free fatty acids increased. Similar observations were made in the triglycerides of the VLD lipoproteins. After coconut oil feeding the percentage of 12:0 and 14:0 increased in both the free fatty acids and the triglycerides. Renaud and Gautheron (21) fed cholesterol from a variety of fat sources and reported that the fats could be classified according to their atherogenicity as follows, in decreasing order: butter, olive oil, coconut oil, cacao butter and corn oil. The severity was correlated with the plasma cholesterol.

Guenter et al. (12) reported that in laying hens higher levels of dietary linoleic acid would increase egg yolk, liver and adipose tissue