EFFECTS OF RICE BRAN OIL, OXIDISED AND FRESH EGG YOLK POWDER ON THE DEVELOPMENT OF ARTERIOSCLEROSIS IN GROWING RABBITS (ORYCTOLAGUS CUNICULUS)

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ABSTRACT
Dietary cholesterol is known to increase the risk of atherosclerosis, whereas antioxidants reduce the risk. It is not clear what effects the oxidation of cholesterol before ingestion could have on the development of atherosclerosis in rabbits (Oryctolagus cuniculus). A study was conducted to investigate the effects of rice (Oryza sativa L.) bran oil, oxidised, and fresh egg yolk powder, on the development of arteriosclerosis in growing rabbits. Rabbit pellets were mixed with 4% of either fresh egg yolk powder, or oxidised egg yolk powder, and the control diet made of rabbit pellets only. The diets were fortified with either 2% corn (Zea mays L.) oil, or rice bran oil, and fed to 10-week-old rabbits for 90 days, at the rate of 100 g per day. Water was given ad libitum. Blood lipids and general performance of the rabbits were monitored during the feeding period. Blood vessels and hearts were examined after the feeding period. Results showed that oil type had no significant effects on all the parameters determined. Total plasma cholesterol was significantly (P < 0.05) higher for rabbits fed on egg yolk powder than control. Low density lipoprotein cholesterol (LDL) was significantly (P < 0.05) higher for fresh egg yolk powder-fed rabbits than oxidised or control diet-fed rabbits, whereas very low density lipoprotein cholesterol (VLDL) was significantly (P < 0.05) higher in fresh egg powder and control diet-fed rabbits than oxidised egg powder-fed rabbits. There was no significant difference in the cumulative mass gain from the different diets. All rabbits fed on fresh egg yolk powder developed some abnormalities in the heart and major blood vessels, while 60% of those on oxidised egg yolk powder developed abnormalities in the heart and blood vessels. No abnormalities were detected in the heart tissues and arteries of rabbits fed the control diet. These results demonstrated that the fresh and oxidized egg yolk powder could have the potential of causing arteriosclerosis and fresh egg yolk powder was more potent than oxidised egg yolk powder. It is recommended that excessive egg consumption be avoided to reduce the risk of cardiovascular diseases.

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