

EFFECT OF CASSAVA PEEL BASED RATIONS ON THE PERFORMANCE,
METABOLISM AND PATHOLOGY OF PIGS

OLUMIDE O. TEWE*

DEPARTMENT OF ANIMAL SCIENCE, UNIVERSITY OF IBADAN,
IBADAN NIGERIA.

Cassava peel is the main by-product of cassava based industries. This constitutes about 18% of the whole root (Oyenuga and Amazigo 1957). With the envisaged high turnover of cassava peel from such industries, nutritionists are becoming more concerned as to the use of this by-product in animal feeding. The incrimination of the cyanogenic glucosides of cassava in endocrinological and neurological anomalies (Ekpechi, 1967; Osuntokun 1968; Delange 1974) has focused the attention of animal productionists to the metabolic and possible pathological effects of cassava in long term animal feeding trials. Studies on pigs by Oyenuga and Opeke 1957, Maner and Gomez 1973, Tewe and Maner 1980, 1981a,b support this claim.

Three diets were formulated to contain 0, 96 and 400 ppm dietary cyanide level. Diets II and III contained 40% cassava peels. Blood samples were analysed for some serum metabolites. Concentration of thiocyanate in various organs were also determined. Female animals were slaughtered at the end of trial (72 days), weights of different organs were obtained while the thyroid, ovary, uterus, and oviduct were subjected to histological analysis. They were fixed in Bouin's solution and stained with Haemaloxilin and Eosin (H&E). Slides were viewed under the light microscope at a power of 10x. Epithelial heights, endometrial and myometrial thickness of the uterine and oviducts measurement were with the calibrated eye-piece microscope.

Performance and cost per gain were similar on all treatments. Apart from the serum urea and cholesterol levels that were significantly ($P/0.05$) lower on the maize control ration, other metabolites showed no significant difference ($P>0.05$) between dietary treatments. Serum urea averaged 41.5, 49.44 and 54.44 mg/dl in diets 1 to III respectively for the serum collected at the end of the trial. Serum cholesterol levels for the same period were 135.0, 137.5 and 154.2 mole/litre for diets 1 to III respectively. Serum thiocyanate concentration was also significantly higher ($P/0.05$) in different organs of pigs on the two cassava peel diets as compared to corn based ration. The organs were kidney, Heart, Liver, Spleen and Lungs.

Histological examinations and slide measurements showed hyperplasia of the epithelia of the thyroid of animals on the cassava peel diets with the condition severer as cyanide level increased. Epithelial heights of the ovary, spleen and thyroid decreased with increase in cyanide level. The myometrium of the uterus showed no statistical difference between treatments ($P>0.05$) in its thickness, while for the endometrium, there was a significant difference ($P/0.01$). While the myometrial thickness of the oviduct increased with dietary cyanide level, there was a corresponding decrease of the endometrial thickness. There was also an increase in the number of matured ovarian follicles on the cassava peel rations.

Conclusions:

The performance data show that cassava peel based rations can be offered to growing finishing swine without reducing the profit margin as long as diets are adequately supplemented with calorie and protein. Our observations however show that the carcass of the cassava fed pigs had higher fat deposits as compared to the control. This might be due to the high supplementation of the cassava peel rations with palm oil in an attempt to augment the calorie level of the feed. The higher thiocyanate concentration of organs on the test diets indicates that consumers of meat from animals fed cassava based diets might be ingesting higher thiocyanate than usual. Increased serum urea levels on cassava peel rations must have largely resulted from the constant depletion of the sulphur amino acid particularly methionine which is used for the detoxification of cyanide. High serum cholesterol level on test diets is a result of high oil content in the diets. Pathological lesions observed in the thyroid gland indicate endocrinological anomalies in the experimental animals on cassava diets. The pathological lesions in the reproductive organs emphasize the possible deleterious effect of cassava peel based rations in the diet of the reproductive herd.

Selected references: Delange F; Monographs in Paediatrics, 1974, Vol. 2, Switzerland; Ekpechi, O.L.; Br. J. Nutr. 1967, 24: 761; Maner, J.H. and G. Gomez; I.D.R.C. Monograph 040: 1973; Osuntokun, B.O.; Brain 1968, 91: 215; Oyenuga, V.A. and E.D. Amazigo; W.A.J. Biol. Chem. 1957, 1: 39; Oyenuga, V.A. and L.K. Opeke; 1957 W.A.J. Biol. Chem 1957, 1: 3; Tewe, O.O. and J.H. Maner; Research Veterinary Science 1980, 29: 291; Tewe, O.O. and J.H. Maner; Toxicology and Applied Pharmacology 1981a, 58: 1; Tewe, O.O. and J.H. Maner; Research in Veterinary Science 1981b, 30: 147.