CASSAVA - AN ALTERNATIVE ENERGY FEED FOR POULTRY IN SRI LANKA.

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Abstract

Nutritional value of cassava is comparable to that of traditional energy feeds and it has a good potential as an alternative source of energy for poultry feeds in Sri Lanka. There are some nutritional as well as non-nutritional problems observed with cassava feeding. However, considerable efforts have been made by various workers to overcome them and to improve the nutritive value of cassava based diets. Maximum levels of inclusion in rations have been recommended but loc informations on this aspect are very limited.

Introduction:

In animal production systems ordinary adopted in Sri Lanka, it is traditional to feed convential feeds such as cereals and oil cakes specially to monogastrics. Since these animals compete with humans for their basic feed ingredients specially the energy feeds and due to the strong demand, the supply of such feed ingredients are inadequate and also the prices are increased. According to the Ministry of Rural Industrial Development (1983), our poultry population and their feed requirement in 1982 were 6.25 millions and 300,000 M.T. respectively. But the total production of compounded poultry feed by B.C.C. and Oils & Fats Corporation was only 52,309 M.T. Today prices range from Rs.5040/- to Rs.5560/- per M.T. These considerations clearly emphasise the need to look beyond the traditional feed resources available so as to alleviate the strong demand. Cassava is one of the heaviest yielders of starch found in the tropics and it has been widely used as a feed and provides the major source of energy in some parts of the world including Asia. According to Wijeratne (1974) the acrage of cassava in Sri Lanka in the end of 1973 was 24,777 ha. and the average yield was 2.4 M.T./ha.

Nutritive value of cassava roots

Cassava consists of almost entirely high digestible starch (91%), it is a very good source of energy for animals. Starch of cassava is similar to that of cereals and it is completely digested by growing chicken (Szylit et al, 1978). Cassava root meal has about 1/3 the amylolitic activity of maize and its metabolizable energy value is similar to that of potatoes. The tuber NFE contains 80% starch and 20% sugar and amides (Vogt. 1966). Longe et al (1977) have reported that the apparent digestibility of cassava for chicks is slightly lower than for cereals, but not significant. The average metabolizable energy value of cassava meal for chicken is about 3045-3200 KCal/Kg (Aguirre et al, 1979; Khajarern, 1979).

Among the minerals in the tuber. P and Fe predominate with minimal amounts of Ca. It is relatively rich in Vitamin C, and contains traces of Niacin and Vitamins A, B_1, & B_2

The protein in cassava is not only very low in quantity but it is also poor in quality. The peel of cassava is much richer than the edible portions.

Problems in the use of cassava.

1. Cyanide toxicity: The cassava tuber contains small but significant amounts of cyanogenic glucosides Linamarin & Lotaustralin. Under the influence of enzyme linamarase, which is also present in the cassava plant both glucosides are hydrolized to produce HCN which is highly poisonous to humans and animals. (Oke, 1978; Onwrens, 1978)

Omole (1977) working with poultry suggested that the activity of the shell gland of the layer may be depressed by the action of HCN which combines with haemoglobin to form a non-oxygen carrying compound cyanohemoglobin. Also cytocrome oxydase activity may be reduced as HCN forms a reversible complex with the Cu of the oxydase system. Iodine availability is similarly hampered in layers fed cassava diets. The results of these reactions may be low hatchability, prolong hatching time and depressed production rate. Sub-lethal, intakes of HCN can induce goitrogenic effects also.

2. Nutritional problems.

Numerous research findings and field reports have indicated that the extensive use of cassava in poultry feeds has encountered some nutritional problems such as; low protein, mineral and vitamin contents; reduction in availability of certain mineral elements; low palatability due to dry texture high ash and crude fiber causing poor digestibility and diarrhea- enzyme inhibiting factors causing poor absorption of vitamins and minerals, poor performance and lack of dipigmentation- and contaminated micro-organisms causing aflatoxicosis (Hutagobling),1976 and 1977; Khajarern at al, 1979 and Oke 1978).

In small doses, Cyanide is detoxified to thiocynate by means of the enzyme rhodase, making use of methionin as the S donor. This amino acid therefore become the first limiting factor in cassava feeds.

Eliminating of HCN in cassava

There are different methods of detoxification developed by various scientists.

i). Decomposing the glucoside directly by heating them above 150°C.

ii). Crushing the roots to allow greater interaction between Linamarse and the glucosides, expressing the resultent products of hydrolysis.

iii) Microbial detoxification

iv) Dry soak-dry method - In Sri Lanka, Rajaguru (1972 & 1975) has found that the HCN in cassava tubers could be completely eliminated by soaking dehydrated tuber chips for more than 6 hours in water and redrying.

Additives for cassava based diets.

Efforts have been made by various researchers to overcome nutritional problems and to improve the nutritional value of cassava by supplementing nutritive as well as non-nutritive feed additives to cassava based diets. (Table 1) These additives include; proteins, synthetic amino acids, minerals, vitamins, antibiotics and antifungals, pigments, flavouring agents and hormones and enzymes.

Table 1: Effects and leves of inclusion of additives in poultry rations.

Additive	Effect	level in the ration.	animal spp.
Methionin	HCN detoxification.	0.2-0.3%	Poultry
Poultry extcreta	Correct the protein difficiency	-	Broiler
Fats & Oils	improve palatability & overcome dustiness.	5%	Broiler
Cassava leaves	Correct protein deficiency	20%	Broiler
Cassava leaves	Improve skin colour and Yolk colour	0.5%	layer
Synthetic pigments	-do-	-	layer
Vitamins	Correct the Vitamin deficiency	-	poultry
Vit. B_{12}	HCN detoxification	-	poultry

According to FAO (1980) recommendations, cassava can be included at 40% in starter ration and 60% in grower ration.

Baker et al (1976) have observed bad effects on egg production performances of layers fed high levels (60%) of cassava. However, it is reported (Montilla, 1976); Enriquez et, al, 1977) that maize in layer rations could be successfully substituted by cassava especially when it combines with rice polish. The recommended level of inclusion by FAO (1980) is 50%.

Cassava root flour can be substitued for cereals in broiler rations at levels upto 30%. But when diets are prepared in the form of pellets, it appears possible to use cassava root meal of levels upto 50% (Montilla, 1976 & 1977). However, in Thaiwan, cassava is used upto 58-60% in rations for broilers successfully (Khajarern et, al, 1979 & 1980).

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