

## ABSTRACTS

## FROM WORKSHOP ON RABBIT HUSBANDRY IN AFRICA

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1. RABBIT HUSBANDRY IN TANZANIA: M Mgheni; University of Dar es Salaam Faculty of Agriculture, PO Box 643, Morogoro, Tanzania.

Though Tanzania has a cattle population of over 10 million, over 5 million goats, 2.5 million sheep, 18 million poultry and 400,000 pigs, there is still a place for rabbit production. At the moment rabbit production is on a very small scale, simply providing meat for the house. The feeds used vary widely from place to place, but the feed most commonly used is wild lettuce, *Leunae cornuta*. This is often supplemented with different types of bran (Maize, Sorghum, millets), cooked food remains (porridge, rice, beans) and brewers mash, cassava root, potatoes, banana peeling, vegetable remains and grasses and hays. There is very little data about the performance of rabbits under these conditions. The author points out that the daily protein intake in Tanzania is an average of 58.1 g/d of which 9.1 is as animal protein and that this is below the 91g/d of total protein with 21g of animal protein considered desirable. A further important point is that despite the large cattle population, the incidence of tsetse is such that although there is a cattle herd of 10 million, 88% is confined to only 7 out of 20 regions. The poultry industry, although well developed, relies on imported concentrates, and also competes with human beings for its feedstuffs. Nearly 50% of the human population of Tanzania is Moslem and this community will accept rabbit meat, but not always pig meat. The ability of the rabbit to utilize a wide range of feeds not suitable for human consumption, coupled with its small generation interval, and relatively large litter size make it a potentially very useful contributor to the Tanzanian diet. The paper goes on to describe a small experiment carried out in the Faculty of Agriculture at Morogoro in which rabbits were fed commercial rabbit meal diluted with maize bran, and produced a growth rate of 19g/d from birth until slaughter at an age of 56 days when they weighed 1068g. Dressing percentage was 57% with 74% meat in the carcass. The author concludes by saying that rabbit husbandry should be encouraged by vigorous extension efforts and increased availability of suitable breeding stock to farmers.

2 RABBIT HUSBANDRY IN THE SUDAN: F M Elamin; Department of Animal Husbandry Faculty of Veterinary Science, Khartoum, Sudan,

In the Sudan rabbits are kept mainly in the backyards of houses and intensive rabbit farming systems such as pertain in Europe and some African countries such as Ghana, have not yet been developed. This is partly due to the availability of cheaper sources of meat. However the rabbit contributes to the budget of those who keep them through the sale of rabbits to the market where they are normally sold live. The per capita consumption of rabbit meat in the Sudan is 0.2Kg/year as compared to 6.0Kg in France and 0.3 in Great Britain. The principal feed is Barseem (*Medicago Sativa*), supplemented with kitchen remains. This is not a sufficiently nutritious diet for high levels of production and much work is needed to formulate suitable diets from local feedstuffs. The major breed is the Baladi (local type) which has a low production potential. Crossbreeding with imported breeds to increase size and litter size is suggested. A threeway breeding programme using the local and two imported breeds is advocated. The author points out that rabbits could be of particular importance in large towns and in areas of the country infested with Tsetse fly, as a source of alternative protein.

3 RABBIT BREEDING AND PRODUCTION IN MOZAMBIQUE: Danilo Gaspari Direccao Nacional de Pecuaria, Miniterio da Agricultura, Republica Popular de Mocambique.

In colonial times there was little interest in rabbit breeding in Mozambique, and a survey made in 1970 gave the total rabbit population as about 168,000. In 1977 the Ministry of Agriculture initiated a programme of rabbit production in Mozambique. This has as prime targets agricultural cooperatives, hospitals, military units etc. A National Centre and provisional centres were constructed to provide housing designs, breeding stock and training facilities. It is hoped to be able to feed the majority of rabbits on green feedstuffs which do not compete with human foods. Thus legumes-either sown such as *Medicago sativa*- or natural such as *Indigofera erecta*, *Psilotricum boivinianun*, *Marrenia tuberosa* and *Leucaena leucocephala* could form the basis of such diets.

4 RABBIT HUSBANDRY IN TOGO: L D Kangni; Batome Animal Husbandry and Formation Centre, BP137, Lome, Togo.

Because of the shortage and consequent high price of meat products in Togo (imported from neighbouring Countries), the Government has recently given greater emphasis to rabbit production. Rabbit production may be divided into three types: Non-specialized family operations in which the number of animals is generally less than 10 and the main feed given is crushed corn and grass. Farms specializing in rabbit production in which there are 50 to 200 animals. Here the rabbits are housed in two-storey cages and the faeces are collected and used as fertilizer. Standards of husbandry are good and feeding is based on wheat bran, crushed corn, rice bran, and other concentrates and dandelion leaves, Since 1976 the price of compound feeds has increased leading to the closure of many of these units, There are three large

units in which the system of management used is similar to that used in Europe and unit size is between 500 and 1,000 rabbits. The technicians running these units are European trained. Rabbit husbandry in Togo is developing and the main problems are lack of materials used for the construction of cages, poor nutrition, lack of selected breeding rabbits and poor fertility, Compound feeds made of low quality ingredients and stored under unsuitable conditions are considered to be a limiting factor in the development of rabbit production in Togo, There are some disease problems due to sores and paw problems as well as enteric disease and scab in badly run operations, The author describes a disease know locally as Cenurose, the symptoms of which are that the rabbits scream run around for minutes, and collapse. They then become paralyzed and will die some 48 hours later. The programme to be realized in Togo is to improve the extension services, to initiate the programme of good breeding rabbits, to erect an animal feed mill, and to supply the construction materials necessary for rabbit keeping.

5 RABBIT PRODUCTION IN ZAMBIA: J P Lungu., Department of Agriculture! PO Box RW291, Lusaka, Zambia.

The first attempt to import rabbits in Zambia took place in 1965, and there was considerable interest especially in the schools and farming clubs. However the interest died down even though climatic conditions in Zambia are suitable for rabbit production. There are still quite a few farmers using imported breeding stock with units capable of producing about 1,000 meat rabbits per year. Housing is simple, based on the use of local material. When kept in small numbers feeding has been based on waste products from the kitchen and garden, and local feedstuffs. However at a commercial level the National Milling Companies do produce rabbit pellets. There is no scientific experimental work today in Zambia, and it is felt that there is a very real need to initiate this work, as well as a programme of education and extension work, in order to popularize rabbit production and the consumption of rabbit meat. At current prices beef is K3.0, chicken K2.0 and rabbit K5.0/Kg (in the supermarket).

6 RABBIT PRODUCTION IN TROPICAL COUNTRIES: J E Owen, Tropical Products Institute, Culham, Abingdon, Oxfordshire, U K

This is a review paper with 44 references. It deals in fairly general terms with the need in developing countries to develop systems of feeding based on local materials, with housing again based on local resources. In developing countries, the vast majority of meat rabbits are produced under small scale or backyard systems. It is in such systems that the rabbit can make valuable contribution towards supplying meat for the poorer urban and rural people. There is a wide range of breeds within developing countries, although the introduction of many well-known breeds (eg, New Zealand White) appear to have adapted well to tropical conditions. There is need for more work to determine the most suitable breeds. In some countries the colour of the rabbit is

important to the farmers and this factor should not be neglected. The nutritional requirements of intensively kept rabbits are fairly well understood. However, there are few data on low input systems, particularly in the tropics. This is important because of the ability of the rabbit to utilize fibrous herbage and agricultural or domestic waste products. In practice, diets can be based largely on garbage, although the value of different herbage species can vary considerably. N.Z. Whites can produce growth rates of 39 g/d up to 2 kg liveweight with good quantity dried lucerne and rye grass. In the Philippines it was found that pare grass *Brachiaria mutica* when fed to does was better than either Napier grass (*Pennisetum purpureum*) or Guinea grass (*Panicum mazimum*.) In many countries however, it is difficult to maintain rabbits solely on fresh grasses and herbage throughout the year. Legumes such as alfalfa, clover, lespedeza, cow pea, vetch, kudzu and groundnut make useful hays since they contain about twice as much protein as grass hay. The use of other species such as *Leucaena* is worthy of investigation. In many areas home mixed concentrate rations made from agricultural by-products is possible. These are better fed as pellets than meal. It is not always easy for the backyard farmer in a developing country to obtain wire of the correct gauge for the floors of the rabbit cages, and the indiscriminate use of any wire has often resulted in problems with sore hocks. It is suggested that information on the design of housing using locally made and designed equipment is an area in which the exchange of information between countries would be very beneficial. Rabbits are prone to a variety of diseases (especially coccidiosis and pneumonia) and parasites, but with good management they need not be serious. The effects of climate are reviewed Performance levels in developing countries are reported as approximately half those in the U.K., with 20 young per doe being reared each year. Slaughter weights of 2Kg at 4 months were common. Governments have a role to play in initiating programmes of instruction and supply of inputs. That these programmes can succeed has been demonstrated in Ghana and Mexico.

## 7 SOCIOLOGICAL ASPECTS OF INTRODUCING RABBITS INTO FARM PRACTICES: Newlove Manattah; National Rabbit Project, Ghana.

This paper outlines the social advantages of rabbit husbandry for meat production, and the success of the Government programme in Ghana for introducing small farmers to rabbit raising. The Government project started in 1972, is based on a farm with a population of some 7,000 rabbits. The farm grows its own sugar cane, sorghum, guinea grass and cassava for rabbit food. Many of the problems experienced by the extension programme can be related to the shortage of foreign exchange. Thus, there are not sufficient funds to import high grade foreign stock, to import veterinary drugs and additives, and also some of the equipment necessary for rabbit housing. The author reports rabbit meat to be very readily accepted in Ghana, and knows of no socially adverse aspects of introducing rabbits into farm practices.

8 METHODS OF SMALL HOLDER RABBIT PRODUCTION: J A McNitt, Bunda College of Agriculture, P OBOX 219, Lilongwe, Malawi.

The Bunda College Rabbit Research Project was established in 1975 to investigate the requirements of the small holder rabbit producer, Two types of housing have been developed: a woven bamboo cage and a modification of the free standing poultry house traditionally used in Malawi. References are given of fuller descriptions of these types of housing. The cages are designed to be constructed from local materials with the minimum amount of wire necessary to hold the structure together. Nest boxes have been made from plywood, but these are expensive, and a pot made from local clay using traditional methods is now under evaluation. Feed and water dishes have also been made from unglazed clay, by a potter. These have worked well for over two years. The stock used has, as its basis, rabbits imported by settlers and Missionaries although N Z White, Californian and Angora blood is evident. The main disease problems are coccidiosis and sarcoptic mange and care is being taken not to transmit these diseases to stock of small holders. It has been found that the mud walls of the main buildings of the housing are a problem in that they house parasites which can transmit these diseases. Attempts to control coccidiosis have included early weaning, frequent cleaning of cages and minimisation of contact between rabbits. Chemicals used have been 0.024% Amprolium, sulphachloropyrazine sodium and sulphaquinaline sodium. None of these have been entirely successful, but movement to new housing and regular treating with Amprolium has reduced the incidence. The best treatment for sarcoptic mange has been found to be gamma benzene hexachloride ointment. There have also been attacks by fly larvae (species unidentified) which develop under the skin. Feet are attacked first and the attack can then spread over the entire body. Squeezing out the larvae and treating lesions with Termadex provides control. Small scale trials have been carried out using *Leucaena leucocephala* (a perennial leguminous shrub), *Tridax procumbens* (a common weed of lawns) and *Amaranthus* spp. Best results were obtained using *Leucaena* which, when given ad libitum with bran ad libitum resulted in growth rates of 60g/. This compared with 36g/week with *Tridax* and 15g/week with *Pennisetum purpureum*. A small trial in which broiler starter mash, or chicken growers concentrate was used is also reported. *Leucaena* was used as the roughage and the growth rates obtained were about 115g/week. It is concluded that with low levels of capitalization using locally available feeds it should be possible for small farmers to produce 16-20 edible carcasses/doe/year.

9 RABBIT PRODUCTION IN DEVELOPING COUNTRIES: Odete Costa Direccao National de Pecuaria, Ministerio da Agricultura, Republica Popular de Mozambique.

The implementation of rabbit production in Mozambique is in 3 phases:

1. Technical trials, training of personnel and production of breeding stock.
2. Installation of regional infrastructure and the collection of data.
3. Production in collective units.

In the first phase a National Centre was established. In the second phase 10 regional centres were set up around the Country. The third phase is carried out with the help and advice from the regional centres.

10 A NEW METHOD FOR RABBIT PRODUCTION: Lovelace N Odonker; Pastor Kristo Rabbit Farm, PO Box 31, Tsito-Awudome, Volta Region, Ghana

This Paper describes the management system used at the Pastor Kristo Rabbit Farm. The rabbitry is divided into 5 sections: quarantine, weaner section, mating section, kindling section and colony section. A detailed account of how the stock are moved from one section to another is given and it is concluded that the advantages of this pen/a-sectional grouping system are: high levels of production, continuous production and supplies of meat rabbits, lower labour requirement and greater management precision.

11 NEW FOOD RESOURCES FOR RABBITS IN MAURITIUS: R Ramchurn, University of Mauritius, Reduit, Mauritius.

Three experiments are described in this Paper in which the objective was to replace a commercial pelleted rabbit feed based on Lucerne, wheat bran and fish meal (all three being imported), and it had the following composition: 16% Crude protein, 2.5% fat and 17% fibre.

*Experiment 1:*

36 N Z White rabbits of initially 800g weight and 45-52d old were divided into 6 groups and each group given one treatment. The treatments were : i) complete rabbit pellets, ii) 50% complete rabbit pellets plus Saccharum spp ad libitum, iii) 50% complete rabbit pellets plus leucaena species ad libitum, iv) 50% complete rabbit pellets plus Stenotaphrum spp ad libitum, v) 50% complete rabbit pellets plus Chloris spp ad libitum, vi) 50% complete rabbit pellets plus Pennisetum spp ad libitum. The sugar cane was fed finely chopped, all other forages were fed long. Over a 60d growth trial the average growth rates were 34.6, 32.4, 39.6, 34.2, 27.8 and 30.4g/d respectively. The conclusion reached was that Leucaena spp, Saccharum spp and Stenotaphrum spp can be used to cut down the concentrate level by 50%.

*Experiment 2*

30 NZ White rabbits of initially about 650g, and 40d of age were divided into 6 groups and given: 100% complete rabbit pellets, or 80, 60, 40, 20, or 0% complete rabbit pellets plus Saccharum spp (ad libitum). The daily liveweight gains over 8 weeks were: 30.6, 29.5, 27.7, 19.4, 11.6 and 4.2g/d respectively. It is concluded that sugar cane (given chopped) may be included to 40% of ration without unduly depressing growth.

*Experiment 3*

48 N Z White rabbits of initially about 700g and 42d of age were divided into 6 groups and given: 100% complete rabbit pellets, or 80, 60, 40, 20 or 0% complete rabbit pellets plus Leucaena leucocephala (Mauritian Acacia) ad libitum. Average growth rates over 8 weeks were: 29.1, 28.6, 27.1, 25.0, 17.2 and 9.5g/d respectively. No rabbits showed any symptoms of toxicity or of alopecia or diarrhoea. It is concluded that Leucaena may provide up to 40% of the ration without unduly depressing liveweight gain.

- 12 REPRODUCTIVE PERFORMANCE OF RABBITS SELECTED FOR POST-WEANING GROWTH RATE: F M El Amin; Department of Animal Husbandry, Faculty of Veterinary Science, POBox 32, Khartoum North, Sudan.

An experiment designed to demonstrate the relationship between genetic origin, litter size and post-weaning growth rate of the dam Litter sizes (born, born alive and weaned) were measured for 5 generations from 4 different crosses. Litter size varied between breeds. Young born in large litters tended to be smaller at birth and weaning. Selection for high post-weaning gain produces genotypes which increase mature weights. A larger mature weight provides an improved material environment, thus increasing litter size in the following generation. It seems that the optimum litter size is 8, corresponding with the number of teats per doe.

- 13 COCCIDIOSIS IN RABBITS: J P Aduma; Department of Animal Science, Egerton College, PO Private bag, Njoro, Kenya.

This Paper describes the disease and the methods of control tried at Egerton College. In a small experiment the following treatments were tried: i) neoterramycin, ii) amprolium, iii) neomycin, iv) terramycin and v) nitrofurazone. All treatments were given orally and were compared with untreated control. It is concluded that there was little or no differences in breed susceptibility and that hygiene and proper housing is essential for proper control of the disease. The average weight gains, and oocyst counts in the liver for the five treatments and the control respectively were 0.19, .11, .12, .17, .14 and .15kg/week and 1000, 380, 740, 1700, 3060 and 5080 oocyst /g of liver for the five treatments and control respectively.

- 14 OBSERVATIONS ON RABBIT DISEASE IN TANZANIA: W D Semuguruka; Faculty of Agriculture, PO Box 643, Morogoro, Tanzania.

A summary of the rabbit diseases occurring in Tanzania is given under etiology, clinical features and pathological changes. The diseases dealt with are: Pasteurellosis, Pneumonia, Coccidiosis, enteritis, Salmonellosis, staphylococcosis, coli, bacillosis, toxemia, cannibalism and hairballs.

- 15 HOUSING OF RABBITS IN AFRICA: James W Rugh; World Neighbours, B P 3035 Lome, Togo.

Rabbits in Africa are raised in a variety of conditions including batteries of cages in commercial rabbitries, backyard hutches made of boards and wire screen, cages made of bamboo, dirt floors and mud huts and even in their natural environment in the wild. In this Paper the author reviews some of these different housing types and looks at some of the criteria to keep in mind when designing housing for rabbits. Two types of housing appropriate to African village conditions are dealt with more specifically: the wood and bamboo hutches commonly used in forest areas. Alternatives for Savannah areas where these materials are difficult to obtain are suggested.

## 16 RABBIT RAISING IN SABODA AREA: Denice Williams

Rabbit raising in Saboda area is part of a family health programme for women, in Ghana. Wood is unavailable for construction so that round mud huts with thatched roofs are used. A secure opening to protect against cats and dogs and a dry roof (wet floors led to worm in the feet) were essential. The highest survival rate amongst the young was where the floor of the hut was soft enough for the doe to dig a burrow. Rabbits were fed local greens, residues from millet beer making, left over millet, sorghum, groundnut and yam peelings.