

## RABBIT PRODUCTION IN UGANDA : POTENTIAL *VERSUS* OPPORTUNITY

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**ABSTRACT:** In only the past ten years, meat rabbit production in Uganda has been actively promoted by enthusiasts, via the "Rabbit Craze", as a get rich quick business opportunity with unlimited potential markets, both domestic and abroad. In Kampala, the capital of Uganda, the infantile rabbit industry can generally be described as a semi-intensive, commercial production system based on high costs of investment (breeding stock, shelter, and wire hutches) and operation (pelleted feed and labor), and non-realized profitability. Further, purebred seedstock producers sell animals at exorbitant prices (25,000-70,000 USH(Uganda shillings) [exchange rate: 1,225 USH = 1 USD]), and feed companies sell pelleted feed at high prices (300-400 USH/kg or 0.24-0.33 USD/kg). This business exploitation invariably forces commercial rabbit producers to sell fryers at light market weights (~2 kg liveweight) and at high market prices in an attempt to recover business costs. In turn, sellers typically double market prices, which further inflate consumer costs at 4,000-5,000 USH/kg. Current market costs for beef and chicken are lower at about 1,700 and 2,200 USH/kg. High consumer costs limit market demand. Notwithstanding this, rabbit meat is not traditionally consumed by Ugandans. In Kampala, only two meat markets, two restaurants, and one university sell rabbit meat (estimated volume of only 100-200 fryers/month). Customers are

mostly expatriates. As expected, many commercial producers have lost money, abandonment rate has been moderate to high, and the present reputation of rabbit production is waning. Paradoxically, real opportunities exist in Uganda to foster development by assisting needy families through a grassroots level, village-based rabbit program. Rabbits can benefit many families, nutritionally and economically, in less time than many other livestock projects and at lower investment costs, but only if a sound project plan is implemented. A proposed development project consists of a subsistence production system, whereby utilization of renewable farm resources (e.g., 5-doe unit, local feeds and building materials, and family labor) and home consumption of inexpensive rabbit meat are primarily emphasized. Concurrently, an economic incentive must co-exist to encourage rabbit production. Appropriate and timely rabbit training, nutrition education, and market development activities will be critical. The initial management of limited pilot projects should foster the gradual development of rabbit meat consumption in villages as a short-term goal and expansion of formal markets for rabbit meat as a long-term goal. An opportunity and a challenge exist to develop a technically sound and sustainable rabbit program in Uganda.

### RESUME La production cunicole en Ouganda : potentialité *versus* possibilités.

En Ouganda, c'est seulement au cours des 10 dernières années que la production du lapin de chair a été activement développée par quelques passionnés, via "la folie du lapin", comme étant une occasion de revenu rapide sur un marché au potentiel illimité, à la fois intérieur et exportateur. A Kampala, capitale de l'Ouganda, l'industrie naissante du lapin peut être décrite comme semi intensive ; son le système de commercialisation est basé sur des coûts d'investissement (cheptel, abri, cages grillagées), d'aliments et de main d'oeuvre très élevés et un rentabilité théorique jamais atteinte. De plus les producteurs d'animaux race pure les vendent à des prix exorbitants (25 000 - 70 000 USH (Shilling ougandais) (taux de change: 1 225 USH = 1USD) et les fabricants d'aliments vendent le granulé très cher (300-400 USH/kg soit 0.24 - 0.33 USD/kg). Cette exploitation commerciale amène inévitablement les producteurs de lapins de chair à mettre leurs animaux sur le marché à des poids faibles (~ 2kg de poids vif) et a un prix élevé, pour essayer de récupérer le coût de production. De fait, les revendeurs doublent pratiquement le prix d'achat ce qui hausse le prix pour le consommateur à 4 000-5 000 SH/kg. Le boeuf et le poulet sont vendus sur le marché à environ 1 700 et 2 200 USH/KG respectivement, c'est à dire nettement moins chers. Le prix élevé à la consommation limite la demande du marché. En outre, la consommation de viande de lapin n'est pas dans la tradition Ougandaise. A Kampala, seulement deux marchés, deux restaurants et

une université vendent de la viande de lapin (quantité estimée : 100-200 lapins/mois). Les clients sont principalement des étrangers. Comme prévu, beaucoup de producteurs ont perdu de l'argent, le taux d'abandon allant de modéré à fort, et la réputation de l'élevage cunicole décroît actuellement. Paradoxalement de réelles chances de développement existent en Ouganda à travers l'aide très pratique aux familles dans le besoin et des programmes villageois d'élevage cunicole. Le lapin peut être une aide substantielle, nutritionnelle et économique, pour beaucoup de familles, dans un délai beaucoup plus court que pour d'autres cheptels, avec un coût d'investissement moindre, mais seulement si un projet pertinent est mis en place. Le projet de développement proposé par l'auteur vise à une production de subsistance, où l'utilisation des ressources renouvelables de la ferme (e.g. : unité de 5 lapines, aliment et matériaux de construction locaux, travail familial) et la consommation familiale d'une viande de lapin à prix de revient très bas sont recommandés. En même temps, un encouragement d'ordre économique doit soutenir la production du lapin. Des formations appropriées et programmées sur le lapin, une éducation nutritionnelle, des activités propres à développer le marché seront essentielles. La mise en place d'avant projets pilotes limités pour promouvoir graduellement la consommation de lapin dans les villages serait un but à court terme et le développement de marchés organisés, un but à long terme. Il existe en Ouganda une chance et un défi au développement d'un programme d'élevage du lapin techniquement valable et durable.

## INTRODUCTION

### Objectives.

According to Nobel Peace Prize recipient, Norman Borlaug, "You can't eat potential." This candid statement shall serve as the theme for this paper. In the Kampala vicinity, the potential for rabbit production is superficially promoted as a business activity to generate

profit. A second and more real potential is the opportunity for rabbit production to serve as a vehicle to foster human development through the alleviation of poverty. The potential has not been realized (despite several years of efforts), whereas the opportunity has yet to be pursued through formal development projects. The objective of this paper is to assess the present status of rabbit production in Uganda, and to provide a development plan of action involving the initiation of

pilot rabbit projects which could ultimately improve the lives of Ugandans who live in poverty.

### History and Human Problem.

In Uganda, from the 1970-80's, the civil war and era of the Idi Amin regime ravaged the country in human loss of lives, hunger, and disease, and in terms of environmental destruction and economic turmoil. Signs of economic recovery have only been realized since the early to mid 1990's. Military forces have undergone retrenchment, but this has contributed to large numbers of unemployed veterans. To provide the reader with some background, the following country statistics were mostly obtained from the website of the CIA (1998). The population size in Uganda is 20.6 million. Average life expectancy is only 39.7 years. Infant mortality is high (98.4/1,000 births), and approximately one in six children does not reach the age of five. Average fertility rate is 6.52 children born per woman. Uganda ranks as the third highest country in Africa in cases of AIDS. Hunger and poverty are rampant. Agriculture is the most important sector of the economy (e.g., coffee, tea, sugar, cotton, and tobacco) employing over 80% of the work force. Average annual salary is exceedingly low (122,500 USH (Uganda shillings) or 100 USD). Also, 81% of the working population is represented by women, only half of which are functionally literate. According to the Ministry of Agriculture, Animal Industry and Fisheries, per capita consumption of milk and meat is only 15.2 liters and 3.6 kg, respectively. Fortunately, opportunities indeed exist for development agencies to provide assistance through appropriate project interventions, including meat rabbit projects.

## STATUS OF RABBIT PRODUCTION IN UGANDA

### The Present Dilemma.

In only the past ten years, commercial rabbit production has been actively promoted in the Kampala municipality of Uganda. The "Rabbit Craze" has lured both entrepreneurs and farmers into the alleged get rich quick business. Promoters have assumed that once production increased that a seemingly unlimited market demand for rabbit meat would be created, both domestic and abroad (e.g., Burkina Faso and Zaire). Nucleus or seedstock breeders sell stock to commercial breeders at exorbitant prices (25,000-70,000 USH or 20.41-57.14 USD). Production targets are unrealistic (e.g., 40 or more marketable fryers produced from 8-9 litters/doe/annum). In actuality, closer to half this production level appears to be realized, based on available production records, diet quality, and physical condition of stock. A four-compartment hutch (designed

for 4 does) constructed of purchased wood and wire costs approximately 250,000 USH (204.1 USD). Pelleted commercial feed sells at the high cost of 300-400 USH/kg (0.24-0.33 USD/kg).

Because of high business investment and operation costs, commercial producers first attempt to sell fryers as breeding stock at elevated prices. However, at present, the demand for breeding stock is believed to be approaching the saturation point as prices appear to be declining. Instead, if fryers must be sold for meat, they are sold at light market weights (~2 kg liveweight) and at high market prices (>2,000 USH/kg of carcass weight; dressing percent is figured at 50%). If the diet consists solely of commercial pellets, using conservative growth (20 g/d) and feed conversion (4:1) figures, it is calculated that a minimum of 100 days are required to produce a 2 kg liveweight fryer at a minimum feed cost of 2,400 USH. This represents a loss of income even while ignoring other business costs. Some producers use pellets for breeding bucks and does, and as a supplement for fryers fed approximately 40 g/d from weaning age (at 1 month and figuring 300 g mean body weight) to 2 kg market weight. This calculates out at a minimum feed cost for only the post-weaning growth period of 1,020 USH per fryer. The profit margin is indeed small if a fryer is sold for 2,000 USH. In turn, sellers typically double market prices, which inflate consumer costs (4,000-5,000 USH/kg of carcass weight). Beef, pork, and chicken meats sell for 1,700, 2,000, and 2,200 USH/kg, respectively. Fish from Lake Victoria sells for less than 1,000 USH/kg.

Based on these calculations, it is evident that only nucleus breeders selling breeding stock appear to be making a profit. In general, commercial rabbit fryer production is not only unprofitable, but it is non-competitive with other meats; moreover, high consumer costs obviously discourage market demand. In Kampala, only two meat markets, two restaurants, and one university sell rabbit meat (estimated volume of only 100-200 fryers/month). Customers are almost exclusively expatriates (60% whites, 30% other Africans, and 10% Ugandans, according to a recent survey (LUZOBE, 1997)). The infantile, albeit superficial, rabbit industry can be described as a semi-intensive production system based on high investment (e.g., breeding stock, shelter, and wire hutches) and operation (e.g., pelleted feed and labor) costs, and non-realized profitability. As expected, many producers have lost money, and abandonment rate has been moderate to high. Needless to say, the reputation of commercial rabbit production is waning.

### Other Problems and Constraints.

Rabbit meat consumption is not a traditional practice of Ugandans. LUZOBE (1997) reported that

only 35.5% of Ugandans have ever consumed rabbit meat. Although taboos influencing the acceptance of consuming rabbit meat do not appear to be a major concern, one common prejudice is the resemblance of rabbits to rats. In Tororo district, a taboo was learned that, "if a pregnant woman eats rabbit meat, the baby will be born with long ears"! In Kampala, while there are probably hundreds of rabbit producers still in the business, claims were made that some producers are now being handed over rabbits to children to simply keep as pets. Further, it is claimed that producers do not know how to properly process a rabbit fryer. Preparation usually involves only boiling the meat in water without the addition of vegetables or spices, only to experience that the meat is bland upon serving, which obviously contributes to poor acceptance.

#### **Role of the Ministry of Agriculture, Animal Industry and Fisheries.**

An interview was held with Dr. Benon K. MWESIGYE at the office of the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). Only since 1995 has the ministry been mandated with the charge of addressing the needs of the rabbit industry. Extension staff have minimal knowledge and experience in rabbit production. According to MAAIF, the Department of Home Economics was said to be teaching women how to prepare various rabbit meat dishes. The University of Makerere and some private rabbit organizations have reported to have made similar efforts. This office provided a figure on the present estimate of the rabbit population in Uganda of 150,000-200,000 does. However, an official population census has yet to be taken. Nonetheless, this country figure is a contribution to the efforts of COLIN and LEBAS (1996) to compile rabbit population estimates for all countries of the world. Of relevance, clearly the largest feed manufacturer in Uganda (Nuvita) shared the figure that 240 metric tonnes of pelleted rabbit feed was milled in 1997. If only 100 g/d of pellets were strictly fed to does as a supplement to forages for the entire year, this would calculate at 6,575 total commercial does. If the above population figure is accurate, it would appear that most rabbit producers do not feed pellets to their stock.

Dr. MWESIGYE also stated that there have been several importations of rabbit breeding stock in the past five years. The year of importation and breeds involved were stated. However, some private rabbit producer associations tend to disagree. These groups contend that only one shipment of commercial stock (New Zealand White) was received several years ago through the efforts of the national rabbit authority at Makerere University, Dr. Gabriel H. KIWUWA. Consequently, these same groups share the concern that inbreeding is

now a serious limiting factor of production. However, local rabbits also exist in the country, especially in rural villages. There is little evidence to support the view that inbreeding depression is a widespread problem. Various rabbit breeder associations who capitalize on breeding stock sales (as elite nucleus and multiplier breeders) are proponents of the universal "LIP" myths:

- L - local rabbits are inferior because of their indiscriminate genetic origin and low production,
- I - inbreeding is rampant (although pedigree records are usually not available to substantiate this claim) so fresh shipments of purebred stock is justified, and
- P - purebred stock of known pedigree are superior in production and should be used to displace local strains.

Based upon several visits to rabbit farmers in the Kampala area, it was apparent that the real problem was basically due to poor feeding and management practices, rather than poor genetic quality, to be described later in more detail.

#### **Suitable Breeding Stock.**

In Uganda, the genetic quality of breeding stock appears to be adequate. On farms where proper feeding and management practices were evident, reproduction and growth appears to be satisfactory. The need for importing unrelated lines of exotic breeds (e.g., Californian and New Zealand White) to offset inbreeding depression and increase performance is not strongly justified. Moreover, exotic x local crossbred fryers are claimed by some producers to grow faster than either local or exotic fryers, and are not as delicate as exotics under typical village conditions. In Cameroon, the New Zealand White has fared well on small farms, but largely because farmers had developed over a period of years a sound feeding and management program (LUKEFAHR and GOLDMAN, 1985). In addition, crossbred does are plentiful and appear to perform well in regards to fertility, mothering ability, and longevity. The level of performance of local and crossbred rabbits on one farm in Luwero district is shown in Table 1. Despite the limited data, these results demonstrate the suitability of local and crossbred stock. These rabbits represent excellent stock for farmer distribution to recipient farmers, especially those that maintain sound feeding and management practices. In other tropical environments, for example in Ghana, local x exotic crossbred rabbits are preferred by farmers (LUKEFAHR *et al.*, 1992). The distribution of young rabbits (3-4 months or older) in exchange for the same number of offspring from the first litters subsequently produced is the recommended measure for "Passing on the Gift" (POG) to ensure project multiplication.



**Village-scale rabbit enterprises managed by women**

In a semi-confinement, free-range system (as observed in Tororo district), local rabbits are recommended for utilization by farmers. These animals display vital adaptation characteristics: small body size, presumed low nutrient requirements on low quality diets, and resistance/tolerance to a tropical climate, local pathogens, and sub-optimal housing and management conditions. Small litters and slow growth to an average mature weight of approximately 2.5-3.0 kg should be viewed as a component of the favorable "economy of scale" in terms of genetic adaptation or rusticity, low cost of production, and ease of management under rudimentary conditions. It is also recommended that opportunities be sought which could lead to genetic conservation of this novel population (BOLET *et al.*, 1996; LUKEFAHR, 1998).

#### **The Opportunity and Challenge for Potential Impact.**

A real opportunity exists to foster human development by assisting needy families through a grassroots level, village-based rabbit program. In the surrounding countries of Kenya, Sudan, and Tanzania, rabbit production has been described as a suitable activity for rural farmers as a source of food protein and income (EL AMIN, 1978; MGHENI and CHRISTENSEN, 1985; WANJAIYA and POPE, 1985). It is proposed that the primary goal of the rabbit project intervention is to offset malnutrition through the regular consumption (1-2 fryers per week) of rabbit meat, based on a small operation (~5-does). In addition, a village based project in which farm resources (feedstuffs, building materials, and family labor) are utilized can dramatically reduce production costs, such that the regular consumption of inexpensive meat by the family can be easily justified. At low production costs, opportunities will exist for successful market development and income generation through the sales of surplus fryers.



**Example of use of local resources : building materials, equipment and breeding stock**

The Cameroon rabbit model (LUKEFAHR and GOLDMAN, 1985; LUKEFAHR 1992) is appropriate for Uganda, despite the discouraging track record of rabbit production in the Kampala municipality. The model is based on a subsistence or extensive production system, briefly described above. However, an economic incentive must co-exist to stimulate or attract farmers to engage in rabbit production. Appropriate training, nutrition education, and market development activities will be critical. A plan of action is presented below. It is proposed that pilot projects be implemented by Heifer Project International (HPI) staff and collaborating service organizations (e.g., Makerere University and Veterinary Services) in designated districts where rabbit farming activities are ongoing. Development of local demand for rabbit meat in villages is a recommended short-term goal, whereas development and expansion of formal markets for rabbit meat in Kampala is a long-term goal.

### **PROJECT DEVELOPMENT PLAN OF ACTION**

#### **General Background and Target Communities.**

The designated pilot project sites are in Luwero, Mbale, Mpigi, and/or Tororo districts where rabbit farming is already established on small farms, primarily in rural villages beyond the Kampala vicinity (the reader is referred to the map of Uganda available at <http://www.odci.gov/cia/publications/factbook/ug.html>). The HPI-Uganda staff will decide whether to start in any one or more of these designated sites.

The Luwero Rabbit Farmers Association has been organized with approximately 50 members. One rabbit farmer (Mrs. Rehemia N. Katumu) helps other farmers in offering local training and timely advise. Mrs. Katumu also keeps excellent records of basic production (Table 1). Another impressive farmer, a

**Table 1 : Summary of rabbit production in 1997 on one small farm in Luwero district involving use of local and crossbred (local x exotic) rabbits and on-farm resource**

| Trait                                     | Average | SE   | Minimum | Maximum |
|---|---------|------|---------|---------|
| Litter size born                          | 6.70    | 0.32 | 4       | 10      |
| Litter size weaned                        | 5.85    | 0.26 | 1       | 9       |
| Kit survival to weaning age (2 months), % | 87.3    | 33.3 | 0       | 100     |
| Litter survival to weaning age, %         | 91.9    | 27.3 | 0       | 100     |

<sup>a</sup> Based on the birth of 37 litters from 9 does

neighbor of Mrs. Katumu, is Mr. Salongo Seguya. Both farmers demonstrate valuable talents as potential local rabbit farmer leaders.

In Mbale and Tororo districts, farmers keep rabbits under either semi-intensive or semi-confinement (free-range) conditions. In the latter system, rabbits (local strain) are let out to forage during the day, and are collected and returned to a small hut at night as a protective measure against predators. The reproduction level of the rabbits appears to be low, but the cost of production in this system is negligible. Some families indicated that rabbit meat is consumed, albeit irregularly. The practice of eating rabbit meat is accepted because of the traditional hunting of a "wild rabbit" which is more likely a hare of the genus *Polagus* (OWEN and MORGAN, 1976). In the Soni community, signs of malnutrition in the children are horrific. The diet is based on starchy foods (e.g., cassava, sweet potatoes, and millet), and there is seldom the planting of legumes, not to mention the rare intake of animal food products.

In Mpigi district, a group of dairy farmers who are mostly women and some of their neighbors have established rabbit production units. However, rabbits are a low priority when it comes to basic care and feeding. For example, the best forages or other available feeds are collected and fed to dairy cattle or to other livestock; any remaining feeds are fed to rabbits, which is usually is of lower quality (e.g., succulents and weeds).

In general, the level of rabbit training in all four districts has been minimal, at best. The present need is tremendous to improve feeding and management practices on even the best farms visited. Too, in the case of most farmers, rabbit farming was initiated as a "cash crop". One poor woman farmer in Mbale only heard that Makerere University was promoting rabbit production and that there was a market in Kampala (~250 km away). She invested considerably into rabbit production, only to learn later that there really was no major market outlet. Unfortunately, many other poor farmers in all four designated districts have also

invested heavily in commercial wood and wire hutches, breeding stock, and in the feeding of pellets. This situation has led farmers to sell nearly all their fryers produced (albeit at a financial loss) in an attempt to recover business costs. Hence, the rabbit enterprise has probably had negligible nutritional impact, to date.

#### Positive Signs of Retrenchment.

In the reality of the lack of formal and well-structured markets for fryers, and exploitation by business promoters and sellers of breeding stock and feed, some farmers down-scaled their operations by using local feedstuffs, building materials, and breeding stock. In Luwero, a reversion from a semi-intensive, commercial enterprise with high economic risk to an extensive, sustainable system which is supported by renewable on-farm resources is gradually occurring. The use of feed pellets has also been discontinued by some farmers. Local wood, brick, stone, mud or cement plaster, etc., as building materials and thatch grass for roofs are being utilized instead of commercial wire and wood. Two useful reports by RUGH (1978) and MCNITT (1980) describe the use of local materials for hutches in Africa. Opposed to building sheds for rabbits, the placement of hutches inside a room of the family compound is practiced on some farms to provide better protection of stock against predators and thieves. At present, production costs on some farms are now quite low, despite the high initial investment. In addition, crossbred stock produced on small farms is commonly saved as herd replacements, as opposed to the purchase of expensive exotic breeds. Despite the favorable restructuring of the rabbit project, it is again emphasized that there is a tremendous need for training farmers, especially in the area of sound feeding practices. In most farm visits, mostly sweet potato vines are being fed as forage (crude protein (cp) is only about 4%; growing rabbits require 16% cp; LEBAS *et al.*, 1997). Few farmers feed legume forages to their rabbits. Energy feeds also appear to be lacking in the diet. Lists of suitable local feedstuffs for rabbits (table 2) and recommended feeding practices (table 3) are provided as a practical guide. A useful and comprehensive summary on the nutrient composition of common tropical plants in Malawi (many species of which are common in Uganda) was reported by AYOADE *et al.* (1985). One fortuitous observation is that farmers, especially in Luwero district, are very responsive to

Table 2 : Suitable local foodstuffs for rabbit in Uganda

| Local forages                   |  | Other local feeds / resources                                     |  |
|---------------------------------|--|---|--|
| Plant                           | Scientific name <sup>(a)</sup>                                 | Plant   | Edible plant part(s)                   |
| <i>Legume forages</i>           |  | <i>Garden/kitchen refuse as a protein supplement</i>              |  |
| Calliandra                      | <i>Calliandra calothyrsus</i> (red flower)                     | Beans   | Leaves from various species (legume)   |
| Desmodium                       | <i>Desmodium distortum</i> (green/silverleaf)                  | Cowpea/Soybeans   | Leaves (legume)                        |
| Lablab                          | <i>Dolichos lablab</i> ("tropical alfalfa")                    | Groundnuts  | Leaves and hulls (legume)              |
| Leucaena                        | <i>Leucaena leucocephala</i> (contains mimosine <sup>b</sup> ) | <i>Garden/kitchen refuse as an energy supplement</i>              |  |
| Pigeon pea                      | <i>Cajanus cajan</i>   | Cassava   | Dried root chips                       |
| Sesbania                        | <i>Sesbania sesban</i> (yellow flower)                         | Maize   | Grain                                  |
| <i>Grass forages</i>            |  | Millet/Sorghum  | Grain                                  |
| Brachiaria                      | <i>Brachiaria decumbens</i>                                    | Sugarcane   | Stalks (chopped)                       |
| Elephant grass                  | <i>Pennisetum purpureum</i>                                    | Sunflowers  | Seeds (avoid leaves, contains tannins) |
| Guinea grass                    | <i>Panicum maximum</i>   | Potatoes/Tomatoes   | Tuber/Fruit (leaves are poisonous)     |
| Kikuyu grass                    | <i>Pennisetum clandestinum</i>                                 | Sweet potatoes  | Vines, peelings, and dried tuber chips |
| Star grass                      | <i>Cynodon dactylon</i>  | Yams  | Peelings and dried tuber chips         |
| Setaria                         | <i>Setaria sp</i>  | <i>Garden/kitchen refuse as fibrous sources</i>                   |  |
| <i>Weeds (highly palatable)</i> |  | Maize   | Leaves and husks                       |
| Amaranthus                      | <i>Amaranthus dubius</i> (consumed by humans)                  | Millet/Sorghum  | Leaves                                 |
| Aspelia                         | <i>Aspelia africana</i> (laxative property)                    | <i>Fruits (surplus or non-marketable) as an energy supplement</i> |  |
| Blackjack                       | <i>Bidens pilosa</i> (high in protein (~20%))                  | Avocado   | Entire fruit except skin               |
|                                 |  | Banana  | Entire fruit with peel                 |
|                                 |  | Jackfruit   | Entire fruit except shell              |
|                                 |  | Mango/Papaya  | Entire fruit with skin                 |
|                                 |  | Passion fruit   | Entire fruit except seedpod            |

<sup>a</sup>Species may vary for some plants.

<sup>b</sup>For rabbits it is recommended that Leucaena be limited to 10% of the diet (dry matter basis).

advice pertaining to the daily feeding of a wide variety of feeds (e.g., forage legumes and grasses, weeds, and garden and kitchen scraps). in follow-up visits, several farmers had adopted certain feeding practices which were recommended in the most previous visit. the area extension agent, mr. aloysius LUMBUYE (secretary of the luwero rabbit farmers association), who also keeps rabbits, has an excellent rapport with these farmers.

it is recommended that hpi develop training materials on rabbit feeding practices (using this report

and the hpi rabbit project manual [module 7: feeds and feeding] by LUKEFAHR (1992) as resource materials) and on preparation of rabbit meat dishes using local recipes. sensitization towards the acceptance of rabbit meat using local recipes also needs to be developed and more broadly emphasized. a variety of training approaches may be used (via farmer meetings, rabbit meat cooking demonstrations and/or formal training).

### PILOT PROJECT SITE RECOMMENDATIONS

Table 3 : Recommended daily feeding practices for village-scale rabbit production

1. Harvest legume and grass forages from established plots
2. Feed 1/3 protein forages to 2/3 other forage sources (grasses and weeds)
3. Offer a minimum of five forage species in each of two daily meals
4. Tie forages in bundles and hang from top of hutch, or use racks
5. Utilize garden and kitchen "wastes" daily to reduce feed costs
6. Feed surplus or non-consumable fruits and vegetables
7. Place feed supplements in feeders to prevent wastage
8. Remove non-consumed feed after 12 hours to prevent contamination
9. Provide water at all times in spill-proof containers
10. Supply a source of salt

#### *Extensive Production System :*

- 1) Select no more than five rabbit farmers as potential demonstration farm sites and leaders, based on interest, motivation, and degree of production success. Screening criteria could include indicators of how much effort is being made by the farmer (e.g., if a variety of feeds are provided, if hutches are kept clean, and if help is offered to other novice rabbit farmers).



Forage plot of lablab (*Dolichos lablab*) on a small farm used to feed rabbits.

- 2) Monitor progress of local acceptance and consumption of rabbit meat by farmers. Once production increases, emphasize the weekly consumption of rabbit meat from 1-2 fryers. Prior training in nutrition, including preparation of local rabbit meat dishes, should be instrumental.
- 3) Provide training, emphasizing sound feeding practices, forage plot establishment (grasses and legumes), recycling rabbit manure to forage and garden plots, local materials for hutches, and basic recordkeeping. Make bi-weekly visits to ensure progress involving HPI staff or other qualified field workers. Once local feeds are secured, discourage use of commercial feed pellets.
- 4) Establish or maintain 5 or more breeding does per demonstration farm. Local or crossbred stock is recommended. HPI could purchase these animals in Kampala, but provide to farmers, via POG (e.g., for every rabbit received, return the same number at 3-4 months of age or older). Farmers should exchange bucks on farms annually to offset inbreeding.
- 5) Down-scale production from a commercial to an extensive system which can be supported entirely by farm resources. The option exists to sell costly

hutches to recover high investment costs. These could be replaced by hutches made from local materials. Some farmers may decide to keep their expensive hutches since they already are in use. Develop a hutch prototype that can be used for demonstration to farmers. If the hutch model is portable then it can be shown elsewhere to farmers during training; otherwise, field trips may be necessary to demonstration farms.

- 6) Monitor local sales of surplus fryers. Records should account for expenses and income. Produce healthy and well developed fryers which will be attractive to business buyers and consumers. It is further encouraged that rabbits be sold at affordable prices (e.g., 1,500-2,000 USH for a 3-4 month-old rabbit that weighs a minimum of 2.0 kg). Continue to sell fryers as breeding stock at premium prices. Later, once this demand is clearly saturated, reduce prices to 1,500-2,000/fryer. By this time, low production costs and also a profit should be realized. This pricing strategy should effectively squeeze out the competition in Kampala in the long term, and also make rabbit meat more competitive to other meats.
- 7) Continue to nurture farmers at demonstration sites as local rabbit trainers and sources of practical advice, breeding stock, forage germplasm, record forms, market information, etc.
- 8) Where POG is involved, monitor this activity, as well as changes in family nutrition status, to determine program growth and impact.

#### *Free-range Production System :*

- 1) Provide training in nutrition, including preparation of local dishes using rabbit meat.
- 2) Select no more than five rabbit farmers as potential demonstration farm sites and leaders, based on interest, motivation, and degree of production success.
- 3) Provide training, emphasizing sound feeding practices, forage plot establishment (grasses and legumes), recycling rabbit manure to forage and garden plots, and basic recordkeeping. Make bi-weekly visits to monitor progress involving HPI staff or other qualified field workers.
- 4) Place quality forages and other recommended feeds (Table 2) in the hut when the rabbits are rounded up at night. Provide a source of water and salt.
- 5) Once production increases, expand the number of breeding does to five or more. Local rabbits are recommended. Later, emphasize the weekly consumption of rabbit meat from 1-2 fryers. The sale of surplus fryers at reasonable prices is recommended.



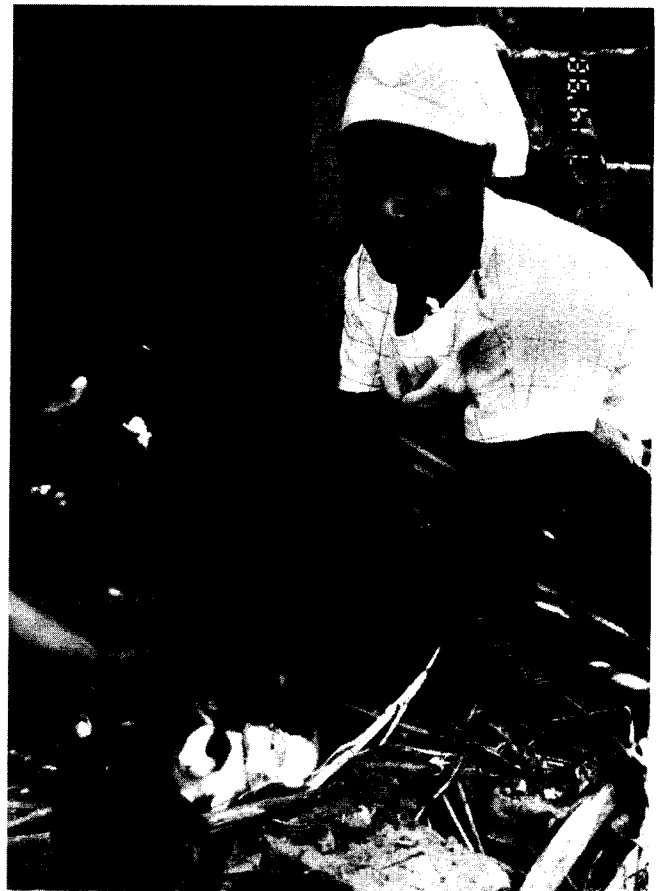
**Free range-system of rabbit production**

- 6) Keep breeding buck in a hutch at all times unless watched closely. Presently, matings are not controlled. Does rearing litters and young does are mating too early. Take the doe to the buck's hutch for mating when her young are 2 months of age. Bucks should be exchanged on farms annually to offset inbreeding.
- 7) Should predation become a problem, the local construction and use of hutches may become necessary.
- 8) Sweep the rabbit manure daily from hutches and transfer to compost pile for use in forage and garden plots.
- 9) Continue to nurture farmers at demonstration sites as local rabbit trainers and sources of practical advice, breeding stock, forage germplasm, record forms, market information, etc.
- 10) Where POG is involved, monitor this activity to determine program growth and impact.

#### **Market Development Strategies.**

As stated previously, rabbit enthusiasts who promoted rabbit production seemed to have made minimal efforts in first developing a viable market for rabbit meat. One noteworthy exception is the Uganda Rabbitry Development Association (URDA) which has conducted a market survey (KAYONGO, 1996) and has prepared reports on marketing strategies. This report is in good agreement with their general findings. A number of rabbit production manuals have also been written in Uganda, but mention is usually brief on the development of markets.

Initially, in each of the four designated pilot project sites, it is recommended that rabbit meat first be consumed regularly by the demonstration farmer's family. In other words, the market demand begins at the family dinner table. Once production is increased, and the family is consuming 1-2 fryers per week, surplus fryers may largely be sold (or provided as an in-kind loan) as breeding stock to encourage neighbors to



**Collection of rabbits and placement into small hut (rear) in the evening for protection**

embark upon rabbit farming. Some of this initial surplus can also be purchased by HPI to supply stock to other project sites. Later, once this demand is fulfilled, additional fryers can be sold locally for meat, but at affordable prices (1,500-2,000 USH per fryer). Sales of rabbits at exorbitant prices would only be counterproductive to the development process in this program.

Local sales may occur by private treaty in the community between neighbors, in the village marketplace, or along roadside stands. Farmers should also be encouraged to occasionally share a rabbit meat dish with their neighbors. An overflow of fryers to surrounding villages may also occur. It is highly desired that within each of the four designated rabbit project sites a strong local demand for rabbit meat be developed, whereby ensuing formal market activities become a secondary benefit of the project. In other words, a "critical mass" of families that accept well the regular practice of consuming inexpensive rabbit meat is pivotal to ultimate market success. This because the nutritional impact is deemed more important than the economic impact of the project.

It is anticipated that by mid to late 1999, it may then be timely for HPI to conduct market surveys which



should culminate in the gradual opening of formal marketing channels. The promotion of rabbit meat to attract consumers will become critical. The development of brochures providing rabbit meat nutrition and recipe information for consumers is recommended. Potential business managers (e.g., meat stores, hotels, and restaurants) should be interviewed to determine their interest in buying well developed and uniform fryers weighing 2.0-3.0 kg at 1,500-2,000 USH per fryer. It is suggested that limited sales (10 fryers) to less than five businesses be initiated. This cautious measure should ensure a steady initial supply. An alternative outlet is to sell rabbit fryers live in cages along the roadside in Kampala city (a common site is live broiler chickens sold in this manner). This approach may involve a "middleman" who collects and pays for rabbits directly from the farmer in villages, such that processing and transportation issues are no longer of concern to the farmer. This and other outlet opportunities should be explored by HPI or other associations. A reputable market specialists might be consulted in these matters.

A village-scale marketing strategy is proposed which basically consists of collective marketing of fryers from farmers. The site for collective marketing could take place on a designated demonstration farm. This activity will need to be coordinated initially by HPI project staff and collaborating parties or individuals, and ultimately by farmer leaders. It is strongly recommended that emerging farmer leaders be actively involved in all aspects of the marketing scheme. Simple processing and transportation arrangements will need to be devised, for example, the local slaughter of fryers and shipment of meat in ice chests to awaiting retail market managers. Initially, HPI vehicles may need to be used to transport dressed fryers to businesses, but later the use of public transportation may be more desirable. Farmers should be paid for their fryers following business sales. A fair deduction should be charged to farmers to cover transportation costs on a per fryer sold basis. Records should be maintained in all business transactions. On a monthly basis, copies of market transactions should be produced and filed in the HPI office.

More specifically, it is recommended that qualified HPI staff or field workers initially examine each fryer which the farmer wishes to sell. First, at the rabbit farmer leader's demonstration farm, fryers from other farmers would be received. Temporary fryer holding cages would be useful. Fryers should be of adequate body weight (suggested range of 2.0-3.0 kg), be well developed (good flesh condition), and be free of any disease signs (e.g., abscesses and diarrhea). Second, HPI should purchase an accurate scale for use in weighing fryers to ensure product uniformity. These

selective measures should serve, too, as incentives to farmers to produce good quality rabbits.

A recommended strategy is the underselling of rabbit fryers (1,500-2,000 USH/kg of carcass weight) in market prices (consumer costs) paid for broiler chickens (2,200 USH/kg) at retail businesses in Kampala. This strategy was effective in increasing market demand for rabbit meat in Cameroon (Lukefahr and Goldman, 1985). As the demand rises, gradually expand marketing outlets by contacting more prospective business managers.

Farmer leaders from other project sites may eventually be guided by HPI to hold regular meetings to discuss market issues. This network group may later develop into a formal rabbit farmers market cooperative. If these developments come to fruition, plans for HPI rabbit program phase-out from project sites in these four districts would be in order. In conclusion, opportunities for small-scale rabbit farming projects can be truly more than mere potential.

**Acknowledgements :** The author wishes to express his sincere gratitude to Heifer Project International (HPI, a private voluntary organization based in Little Rock, AR, USA) who requested and funded the author's consultancy mission to Uganda (July 8-22, 1998).

Received : November 13<sup>th</sup>, 1998

Accepted : December 5<sup>th</sup>, 1998

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