

PRESENT STATUS OF THE HEIFER PROJECT INTERNATIONAL-CAMEROON RABBIT PROGRAM : BACK TO THE FUTURE

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ABSTRACT: In the past five years, Heifer Project International (HPI) has distributed 2,119 rabbits to 1,410 limited-resource families in 66 villages primarily located in the northwest province of Cameroon. However, these figures exclude thousands of additional farmers who received either direct or indirect assistance by HPI since project inception in 1982. HPI's approach towards poverty alleviation is to financially support a new rabbit project for farm families in a selected village for a period of three years. Technical follow-up support is then extended for an additional two years, after which time the anticipated self-sufficient project is formally phased-out. In 1999, accompanied by HPI field staff, the consultant (the first author of this paper) visited a total of 48 farmers from 10 villages in the northwest province. On each farm, notes were taken which identified poor to good management-level

practices, housing and feeding systems, as well as socio-economic aspects of the project. HPI progress reports and case studies conducted by student interns from University of Dschang were made available to supplement the consultant's notes in developing this evaluation report. Overall, production level of rabbit fryers presently appear to be low on farms (approximately 2.45 fryers are consumed and 2.61 fryers are sold per month). Further, income generation is a critical determinant of whether rabbits will continue to be regarded by farmers as a backyard livestock species for domestic use or as a commodity species for supplemental income. HPI could play a pivotal role in developing either local or formal market outlets for their surplus fryers. To date, the HPI-CAM rabbit program has improved family nutrition, enhanced community development and gender status in villages.

RÉSUMÉ : Le point sur le programme lapin au Cameroun du Projet Heifer International : retour vers le futur.

Au cours des cinq dernières années, le Projet Heifer International (HPI) a distribué 2119 lapins à 1410 familles à faible revenu dans 66 villages, principalement situés dans le nord-ouest du Cameroun. Ces chiffres ne tiennent pas compte d'un millier de fermiers supplémentaires qui ont reçu, depuis l'installation du projet en 1982, plus ou moins directement, une aide du HPI. La réponse du HPI face à la pauvreté a été de supporter financièrement un nouveau projet d'élevage de lapin dans le cadre familiale, dans un village choisi, pour une période de trois ans. Un suivi technique a été prolongé de deux ans, puis le projet d'auto suffisance a été arrêté. En 1999, le consultant (premier auteur de ce papier) accompagné des intervenants HPI de terrain, a visité 48 élevages dans 10 villages du nord-ouest. Pour chaque unité on a noté, de bon à mauvais, les pratiques d'élevage, le logement

et le système d'alimentation, ainsi que l'aspect socio économique du projet. Pour compléter les notes du consultant, des rapports du HPI et des études de cas, conduites par des étudiants de l'Université de Dschang ont été mis à sa disposition. En conclusion, le niveau de production des lapins de chair est actuellement bas dans les élevages (environ 2,45 lapins sont consommés et 2,61 par mois sont vendus par élevage). De plus, le revenu potentiel est le principal déterminant dans la décision des fermiers de considérer le lapin comme une espèce de basse cour à usage familial ou comme une espèce génératrice de profit supplémentaire. Le HPI peut jouer un rôle charnière en développant pour ces lapins source de profit, aussi bien le marché local que les marchés plus organisés. A l'heure actuelle, le programme HPI-Lapin Cameroun a amélioré l'alimentation familiale, accru le développement communautaire et le statut des femmes dans les villages.

INTRODUCTION

Rabbit scientists generally contend that the greatest potential or *future* of the domestic rabbit is as an inexpensive source of nutritious meat and farm income for human development in lesser developed countries. From 1983 to 1985, the lead author of this paper was assigned by Heifer Project International (HPI) to Cameroon, West Africa, to initiate a self-help, rabbit development program. Since that time, the program has flourished and continues to benefit thousands of families. In 1999, the lead author was sent by HPI as a consultant to re-evaluate the program. Hence, it is apt to sub-title this paper "*Back to the Future*".

Since 1982, Heifer Project International (HPI) has assisted small-scale farmers in villages by introducing rabbit projects throughout the northwest province (NWP) of Cameroon. The NWP is a grassland,

savannah and mountainous ecological zone, geographically located between longitudes of 5.20 and 7.20°N and latitudes of 9.7 and 11.5°E. Its altitudes range from 500 to 3,011 m. Rainfall varies from 300 to 3,000 mm (rain season is from March to October) with the wettest months being July and August. Temperatures vary by month from 14 to 28°C. The environment is quite favorable for rabbit production, more so than the tropical environments found at lower altitudes.

The population in the NWP of Cameroon is approximately 1.25 million people, according to official provincial reports. While provincial data is limited, the gross domestic product per capita (purchasing power per person based on the country's wealth) is only \$2,100 (CIA, 1999). National figures for fertility (5.9 children born per woman), infant mortality (7.7%), and average life expectancy (51.4 years) are reported (CIA,

1999). A number of provincial reports figure that the average family size tends to be from 6 to 8 members. Largely an agricultural region, 78% of its inhabitants subsist in rural areas on small farms with agricultural activities engaging some 70% of the workforce. However, women represent 67% of agricultural work done on the family farm (AKOB *et al.*, 1996), while the literacy rate is only 26%. According to AKOB *et al.* (1996), based on a survey conducted in the NWP involving 15 villages and 187 respondents, 42.8 and 41.2% of the responsibility of livestock management on farms is done by women and children, respectively. Hence, a gender-awareness focus exists in most of the ongoing HPI-CAM livestock projects with a majority of its clients (62%) presently represented by women.

The HPI-Cameroon (HPI-CAM) rabbit program was initiated in 1982 when there were few rabbits in the province. In 1983, the consultant (the first author of this paper) was hired by HPI for two years to initiate small-scale rabbit projects in the NWP, based on a 3- to 5-doe model involving local technologies and use of renewable local resources. By 1985, a total of 561 farmers, extension agents, missionaries, Peace Corp volunteers, *etc.*, had received formal rabbit training and had received 1,934 breeding rabbits through HPI rabbit program efforts. In 1986 and 1991, the rabbit program was re-evaluated by the consultant at the request of HPI headquarters.

To date, the HPI-CAM rabbit program has benefited a minimum of 1,410 families in 66 villages (not only in the NWP but in other provinces, as well) since 1994. According to a census taken by the Ministry of Livestock, Fisheries, and Animal Industries (MINEPIA), in 1992-1993 some 15,000 rabbits in the NWP was reported, although this figure is most certainly a gross under-estimate. In 1993, HPI reported an estimated 34,020 rabbits kept by farmers being directly assisted by HPI in the province. Rabbit projects maintain high priority among HPI-CAM staff (relative to other livestock projects - beef and dairy cattle, goats, poultry, and swine) as a cost-effective and rapid means to help alleviate poverty and improve the standard of living and also empower women. The HPI-CAM rabbit program has been well documented since its inception through progress reports, periodic program evaluations, and publications in popular refereed journals (LUKEFAHR and GOLDMAN, 1985, LUKEFAHR and CHEEKE, 1991a,b). In addition, the HPI-CAM rabbit program has been used as a role model by HPI and other non-governmental organizations (NGO's) in developing rabbit projects in other lesser developed countries.

The consultant's mission was to determine the present status/impact of subsistence-level rabbit production on farms in the NWP, based largely on farm visits made in several villages. More specifically, farm



In recent years, Heifer Project International (HPI) has further increased the number of rabbit projects in Cameroon managed by women to elevate gender awareness and social status.

visits involved a technical assessment of the farmer's management ability, experience, and level of success. Data and information gathered from farm visits were also supplemented by recent HPI progress reports and other survey documents in developing this evaluation report.

PRESENT STATUS OF RABBIT PRODUCTION ON FARMS IN THE NWP

Genetic characterization of local rabbits in villages.

Rabbits found in villages of the NWP have been previously described by LUKEFAHR (1983) and LUKEFAHR and GOLDMAN (1985). Briefly, as documented in other West African countries, rabbits were most probably first introduced to Cameroon over 100 years ago by the early European colonists and/or American and European missionaries as a food animal species. Of historical significance, in Cameroon, several provinces were at one time occupied by British, French, and German colonists, which may serve as a clue as to the earliest rabbit stock origins. More recently, in 1983, the HPI-CAM rabbit program was initiated by acquiring breeding stock from Francophone provinces where it was claimed that European and U.S. breeds had recently been imported from France. In other words, there was probably a long period of repeated stock introductions. The latter source of animals were distributed to trained farmers in the NWP. In 1993, HPI imported 30 New Zealand White rabbits which were directly placed on well-managed, small farms in villages.

The term, "local rabbits", is herein described as crossbred rabbits found on small farms in villages. Phenotypically, there is considerable observed variation for pelage colouration, body size, and morphological characteristics. LUKEFAHR (1983) inventoried 18 major coat colour and pattern genes segregating in the local

Table 1 : Simple statistics on actual and predicted body weight (kg) of local rabbits in village

Age, months	Mean	No of Records	Range, Min	Range, Max	SD	Predicted weight ^a
0.00	0.12	3	0.07	0.15	0.10	0.05
0.25	0.22	5	0.13	0.40	0.11	0.14
0.50	0.20	9	0.13	0.40	0.09	0.22
0.75	0.23	9	0.16	0.31	0.06	0.31
1.00	0.45	26	0.19	0.88	0.20	0.40
2.00	0.78	28	0.23	1.40	0.27	0.75
3.00	1.16	24	0.54	2.00	0.36	1.10
4.00	1.39	21	0.77	2.00	0.38	1.44
5.00	1.73	22	1.16	2.30	0.35	1.78
6.00	2.04	29	1.16	3.00	0.43	2.08
7.00	2.47	11	1.50	3.70	0.61	2.35
8.00	2.48	18	1.55	3.10	0.41	2.59
9.00	2.67	9	1.80	3.30	0.50	2.78
10.00	2.88	47	1.87	3.90	0.43	2.92

^a Prediction formula : $Y = 0.0509 + 0.3416(A) + 0.006786(A)^2 - 0.001228(A)^3$, where Y is the predicted body weight (kg) and A is the age of rabbit (months).

rabbit population which were unique to certain breeds (e.g., Dutch and English white-spotting, Himalayan pointing, and Japanese brindling). Significantly, it is plausible that high levels of polymorphism exist, contributing to substantial levels of additive genetic variation and(or) heterosis, which may be important for reproduction, growth, and survival traits, especially in the challenging village environment. In support of this hypothesis, LUKEFAHR *et al.* (1992) reported heritability of 0.42 for 90-day body weight from a very similarly described rabbit population in Ghana. Moreover, since the earliest stock introductions, it can also be presumed that genetic adaptation has occurred through natural selection, enhanced by high levels of available genetic variation.

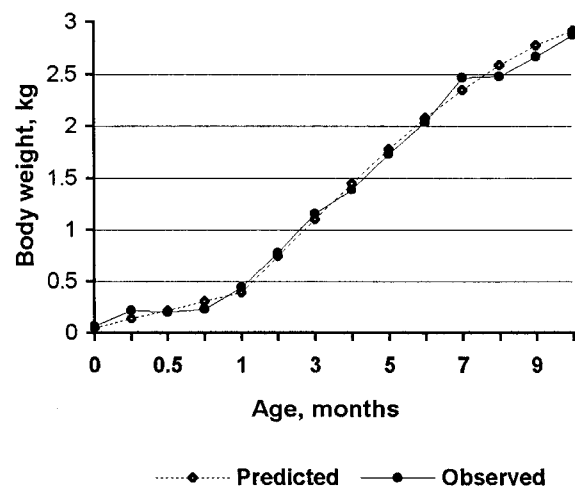
Production of local rabbits in villages.

A survey conducted by KONGYU (1998), involving 60 farmers assisted by HPI in 7 villages in the NWP (Bamunka, Kitcho, Mankon, Nkwen, Weh, Wum, and Wvem), reported mean litter size at birth of 6.7 ± 1.1 kits. Litter sizes of less than 5, between 5 and 7, and more than 8 kits were observed with a frequency of 13.3, 58.3, and 28.4%, respectively. A similar estimate of 7.4 kits was reported by LUKEFAHR and GOLDMAN (1985) involving data collected from 7 village project sites in the NWP. In the KONGYU (1998) survey, most farmers produced from 3 to 4 litters per doe in a year, which related to a majority (68.3%) of farmers having produced a cumulative total of 16 to 28 kits per doe per annum (overall mean of 4.5 ± 1.2 kits weaned per litter). These figures are consistent with projected targets of 4 litters per doe (each containing 5 weaned fryers) and a total of 20 marketable fryers per year

(OWEN, 1981; LUKEFAHR and CHEEKE, 1991a; LEBAS *et al.*, 1997). Most farmers maintained a 3 to 5 doe operation, whereby it can be calculated that 1 to 2 fryers were available for family consumption per week; surplus fryers being sold to supplement farm income.

In 1995, an HPI survey was carried out on 56 farms in 20 villages located in 5 divisions of the NWP. Growth measurements were taken on kits and fryers (n=1,282 total rabbits) from birth (weekly to 2 months) to 10 months (monthly from 2 to 10 months) in the months of May and June. The end-point, 10-month weights actually included ages ranging from 10 to 12 months, which was assumed to represent maturity. Body weights were averaged for rabbits of the same age within the closest week or month of age class, yielding a total of 261 average weight records. This procedure explains why mean birth weight, for example, appeared to be higher than expected. Simple

statistics for body weight are presented in Table 1. A best-fit prediction equation (shown in the Table 1 footnote) was obtained from a model that consisted of division (Bui, Menchum, Mezam, and Ngoketunja), village within division (Bui -Bamikikai, Kimar, Kishong, Mbamsong, Ngondzen, Nkar, and Sop; Menchum - Buabua, Jaalim, Weh, and Wum; Mezam - Akum, Bali, Bambui, Bawock, K.-Ketingoh, and Mankon; Ngoketunja - Bamessing and Bamunka), farm within village by division, age as a linear and quadratic covariate, and residual (within-farm) sources. Buabua village is actually in the Boyo division, but since this was the only village in Boyo division, it was grouped in the Menchum division where it borders some of the

**Figure 1 : Prediction of growth of local rabbits**

villages previously listed. From the equation, it was

predicted that a 2.0 kg body weight (considered as standard market weight) should be obtained by 6 months (Figure 1). The prediction equation can be used as a marketing tool to determine live weights of fryers when only the age is communicated by farmers to HPI offices in coordinating shipments to buyers.

The calculated average daily gain between 2 months (weaning) and 6 months was only 10.3 g/d, in agreement with 15.1 g/d reported by KONGYU (1998). In developing countries with similar environments, 2.0 kg market weights have generally been reported by 4 months of age with an average daily gain figure of 20 g/d (LUKEFAHR and CHEEKE, 1991a,b). The slow growth rate is most certainly a major reflection of the sub-optimal diet and(or) feeding practices, because on some farms there were average body weights of 2.0 kg recorded by 4 months (hence, ruling out genetics if one assumes that farmers possessed similar quality stock). However, under local conditions (including a forage-based diet without commercial concentrate), and low production costs, it was still profitable to produce table fryers at such a late age (6 months) as discussed later in this report.

A variance component analysis was also performed whereby a subset of the data involving 3 to 10 month weights (involving age classes with 2.0 kg weight records) was used to assess uniformity of fryer weights. Variances were similar across age classes except for that observed at 7 months (attributable to one maximum weight record of 3.7 kg), and data were adjusted linearly to the overall mean age of 6.70 months. Division, village within division, farm within village by division, and within-farm accounted for 0.0, 12.4, 15.7, and 71.9% of total variation, respectively. Basically, fryer weights tended to be fairly uniform across divisions, villages, and farms, which would enhance the reliability of obtaining uniform fryers if only age information is communicated from villages to the HPI office in Bamenda. The large, within-farm variance (71% of total random variation) invariably included potential factors such as litter size, dam's milk production and parity, and health status.

On-farm visitations.

During the consultant's stint, on-farm visits were randomly made to 48 farmers in 10 villages in 5 divisions of the NWP. In these 10 villages (Bamessing, Dzeng, Fakui, Finge, Kicho, Mbakwa, Mughu, Ngwo, Romajai, and Shisong), a total of 317 rabbit farmers were organized into community development groups. On the 48 farms visited, body condition scores (on the basis of fur and flesh condition determined by visual and physical examinations) of rabbits were taken involving scores of poor (0), poor-fair (0.5), fair (1), fair-good (1.5), and good (2). Figure 2 shows that 73% of farmers had stock that were in fair to fair-good

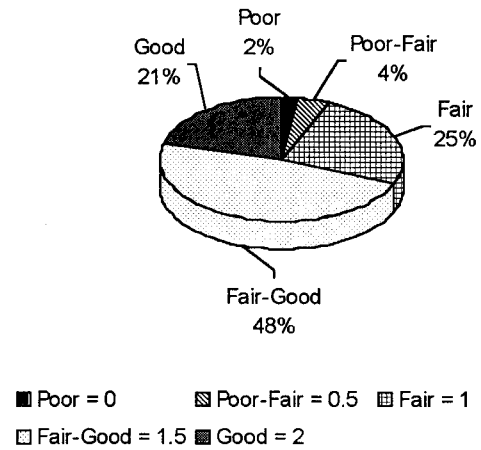


Figure 2 : Body condition scores

condition, primarily regarded to be a reflection of feeding practices to be described later. Only 21% of farmers visited had rabbits that were in good body condition. Overall, based on the above results for production-related traits, it is evident that local rabbits appeared to produce satisfactorily under village conditions, especially when well managed.

Housing, hutches, and equipment.

Since 1982, farmers have adopted local systems involving housing, hutches, and equipment. Rabbits were either found in hutches confined to an indoor room of the family home, in hutches attached to an outside wall of the home, or in a shed made of local building materials at low cost. Hutches and nestboxes were typically constructed of raphia palmwood (*Raphia ruffia*), a plant which is widespread in the NWP. Feeders and waterers, if used, were often refuse tins, bottles, pans or split bamboo.

During the consultant's on-farm visitations, the condition of hutches (*e.g.*, consideration of construction quality, adequacy of dimensions, and level of upkeep) were also scored (using the same scale described above for body condition). The majority of farmers (68%) had fair-good or good scores indicating that hutch quality was acceptable (Figure 3). Only 6% of the farmers received poor to poor-fair scores. Of these, hutches made of raphia sticks showing large gaps (>2 cm) were observed, especially in the floors, whereby newborn kits could easily be lost. Most farmers maintained clean hutches as achieved through daily brushing and removal of feed wastes and manure. For hutches located inside the family home, a common problem was inadequate light exposure. It was recommended that windows be left open, and that bars be inserted into window frames to prevent entry of predators (usually cats and dogs) and thieves.

Table 2 : Relationship between hutch location and observed (expected) kit survival at different stages

Hutch Location	Neonatal		Preweaning		Overall	
	Number of kits					
	alive	dead	born alive	died	born alive	died
Inside shed	187 (189.2)	25 (22.8)	157 (155.5)	30 (31.5)	157 (157.3)	55 (54.7)
Outside	62 (68.7)	15 (8.3)	46 (51.5)	16 (10.4)	46 (57.1)	31 (19.9)
Inside home	315 (306.1)	28 (36.9)	266 (262.0)	49 (53.0)	266 (254.5)	77 (88.5)
Total	564	68	469	95	469	163
Chi-square value	8.74*		4.02 ^{NS}		10.43**	

*P<0.05. **P<0.01.

In the survey report of KONGYU (1998), kit mortality was recorded during the rain season months and tabulated according to hutch location. For this evaluation report, data from KONGYU (1998) was subjected to Chi-Square analyses, which revealed that a relationship existed (P<.01) between hutch location and mortality (Table 2). Hutches located outside along the home (veranda) had higher than expected numbers of deaths at or shortly after birth (whereas the opposite trend was detected for hutches inside the home), and overall preweaning mortality (including stillborn kits) between birth and weaning age (2 months). However, there was no such association for preweaning mortality when stillborn cases were excluded. Proportionately more neonatal deaths may have occurred due to more cold exposure in hutches not contained in rooms or sheds. However, it was observed that most farms that experienced the highest mortality levels did not provide

a straw nest when nestboxes were provided to pregnant does. During the consultancy, it was further noted from farmer records that early mortality of kits was lower on farms when grass hay was supplied in nestboxes, regardless of hutch location. Hence, the mortality problem can be controlled through proper management.

Local diets and feeding practices.

Diet quality scores (using the same scoring system as described above), relating to basic nutritional or feeding value and variety of feeds (e.g., legumes are a good protein source and yams are a good energy source), were also

recorded on farms. For example, a poor score was assigned if a farmer either fed mostly grasses and weeds to their rabbits without rich energy or protein feed sources or if a farmer provided no feed at all on the day of the visit. A farmer that provided energy but limited protein feeds, or *vice versa*, tended to receive a fair score. Most farmers (77%) demonstrated poor to fair feeding practices (Figure 4) as most did not possess forage plots. If these observations are a general reflection of feeding practices on most HPI-assisted rabbit farms, then this result is of major concern, no doubt accounting for the slow fryer growth, fair body condition, low fertility, and high kit mortality as observed on a number of farms. Moreover, in some villages, farmers had provided no feed or water to their rabbits on the day of the pre-planned visits. This sign is a reflection of project apathy. However, an analysis of the score data revealed that mean diet quality scores

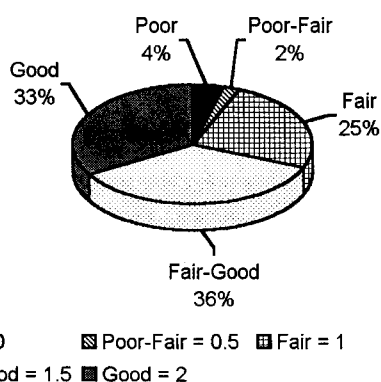


Figure 3 : Hutch quality status on farm

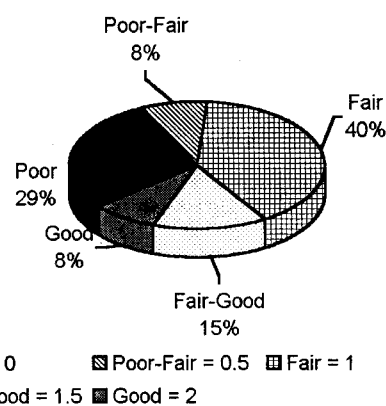


Figure 4 : Feed variety/quality

varied across villages ($P < .05$). Poor milk gland development of does nursing young litters (<3 weeks-old) that did not receive drinking water was also observed. In such cases, farmers complained about high kit mortality which they, instead, attributed to cold temperatures during the present rain season. From a social perspective, it is likely that farmers (especially women) spend less time feeding their rabbits in the rain season, when distracted by the rains, and that the labour demands of their fields and gardens are great during times of planting and harvest. In agreement with the latter feeding management observations, KONGYU (1998) generally stated that rabbit farmers had "... low mastery of some important management aspects."

In each of the 10 villages visited, rabbit club members met with the consultant and HPI-CAM staff to discuss the impressions of the visit. The major subject discussed was recommended feeding practices. To illustrate, legume species and other protein rich feeds and energy feed sources were identified and discussed. It was recommended that one-part protein feeds to three-parts other forage feeds (tied in bundles and hung from the top of the hutch), and energy and mineral (ground bone meal and salt) sources be provided daily in feeders and given *ad libitum*. The benefits of established grass-legume forage plots were emphasized. Forage and garden plant species available in Cameroon are similar to those reported in Uganda by LUKEFAHR (1998). In addition, stylosanthes (*Stylosanthes spp.*) and Guatemala grass (*Trisacum laxum*) are also found in the NWP. Water was recommended to be continuously provided, as well. Farmers appeared to be responsive to the advice. Timely follow-up technical visits by HPI-CAM staff will be critical to ensure successful adoption of recommended feeding practices. Lastly, it was clearly emphasized to farmers that rabbits will take good care of your family... but only if you take good care of your rabbits!

On-farm project impact.

Well-managed rabbit operations have benefited poor families in more ways than in providing a regular supply of meat and supplemental income. This general statement is despite some of the managerial shortcomings observed by the consultant. The rabbit component has enhanced farm diversification through effective integration which promotes food security. Skins from processed fryers can either be cooked and consumed or tanned to make a variety of products. In Mbakwa village, it was observed that rabbit skins were used to make foot sandals for children. Manure can be used to conserve farm soil nutrients. In Mankon village, some farmers sell rabbit manure for 500 F-CFA/kg to neighbors to improve their farm soil fertility. In addition, social justice has been realized through poverty alleviation and gender empowerment. At the

more successful village project sites, women have increased their leadership abilities, literacy level, organizational skills, *etc.*, as active members of community development groups, achieved after becoming involved in a rabbit project. Moreover, the people have come to understanding the development process as a means of improving their quality of life.

Specifically concerning nutritional impact, the present survey revealed that 93% of the farmers interviewed claimed to consume at least one rabbit fryer monthly. Mean consumption was calculated at 2.45 fryers per month. In close agreement, in the survey report by GENKAHA (1997), 95% of the 78 farmers interviewed from Mankon village stated that they consumed rabbit meat at least twice monthly. Because rabbits are considered as "backyard species" with limited formal market opportunities (a "Blessing in disguise"), some families consume rabbit meat more regularly than other traditional meats. Hence, this is an important and unique niche occupied by the rabbit. Culturally, in Sub-Saharan Africa, it is seldom that a family consume goat meat or pork, as these species are traditionally utilized as "walking banks" for emergency purposes (NRC, 1991). Likewise, village chickens are usually not consumed regularly, but are often given as a gift (a "dash") to a family in the community celebrating a birth or mourning a death (RUSHTON and NGONGI, 1998). In addition, NUWANYAKPA *et al.* (1997) reported survey results indicating that farmers in the NWP ranked rabbit meat third after chicken (first) and beef (second) according to preference. However, the



A typical Cameroonian meal (corn meal and « jama-jama » greens) devoid of nutritious animal food products considered a luxury in the lesser developed countries.



A rabbit shed on a small farm constructed of local materials displays pride of project ownership.

cost of beef in particular is not affordable for many families. In agreement, HOFFMANN *et al.* (1992) reported in Burkina Faso that rabbit meat was being more commonly accepted for consumption at ceremonial feasts and other social events, even by Muslims.

While the rabbit meat consumption activity (93%) is encouraging, the low frequency of consumption (2.45 fryers per month) is somewhat discouraging. It falls well below the program target of the family consuming 1 to 2 fryers per week. Rather, only 20% of the farmers interviewed (6 out of 30 farmers) were meeting this target (Figure 5). However, it was learned during the visits that it is common for farmers to “dash” a rabbit to their neighbor for a meal, or to share rabbit meat dishes during social and (or) ceremonial festivities. During the farmer group meetings, farmers were advised and encouraged that fryer production could well double by simply adopting better feeding practices as described above. In agreement with present figures of low consumption levels, previous HPI progress reports (involving families in 54 villages over a 5-year period) indicate that only 0 to 1.7 fryers were consumed



A day of village celebration as rabbit breeding stock is distributed to trained farmers.

monthly.

An estimate of the economic impact of the project was also obtained based on previous HPI progress reports and the present survey involving available records. In the former case, the range of the number of fryers sold per month by family is from 0 to 2 fryers. From the present survey, for farmers who had been raising rabbits for at least 1 year, an estimated mean of 2.61 fryers sold per month (based primarily on local sales) was calculated. In Figure 6, the distribution of fryer numbers sold is skewed to the right with most farmers (83%) falling below the sales of 4 fryers per month. Using the 2.61 mean value, if average fryer weights were figured at 2 kg, and based on the present market price of 1,000 F-CFA/kg, this represents a revenue sales of 5,220 F-CFA's per month, which should represent a significant income contribution for the family. The 5,200 F-CFA per farmer figure agrees with economic impact figures from recent HPI progress reports. Paradoxically, if no rabbits were sold by the family, then the target consumption of 1 to 2 fryers per month would appear to be met. Of course, the better strategy is to improve feeding practices to increase fryer production levels, whereby both primary objectives (meat and income) could be realized, rather than

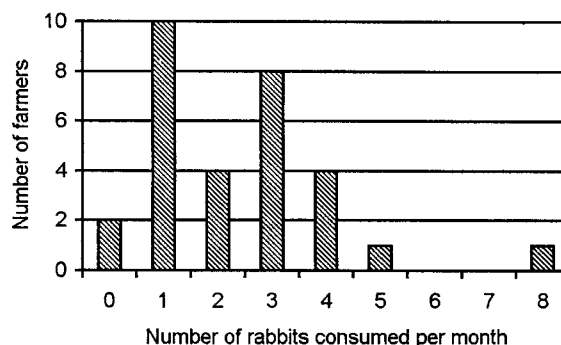


Figure 5 : Histogram of nutritional impact

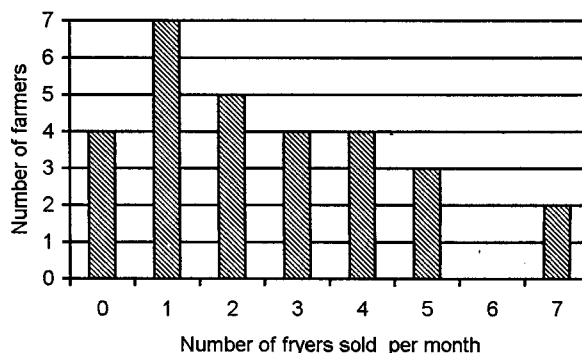


Figure 6 : Histogram of economic impact



The « HPI-CAM » program team and S.D. Lukefahr in Cameroon.

increasing breeding animal numbers. This assumes that local markets can absorb the increased fryer supply. The market price of a rabbit fryer should be less than that for a broiler chicken in order to be competitive (LUKEFAHR and GOLDMAN, 1985).

Ideally, any agricultural improvement innovation or project should have an economic incentive to attract and motivate farmers. A common grievance among farmers is that there are no formal markets for rabbit meat. Although some success has been made by HPI in the past, the present situation does hold much promise for several reasons. Because rabbits are raised mostly in villages than in towns, it is difficult to coordinate rabbit marketing. Communication problems between farmers and HPI staff has also been a major constraint. For example, HPI might receive an order for 50 rabbits from a hotel manager, but, for example, when the staff go out to collect the rabbits in villages it soon becomes evident that the previous communication which stated that 50 fryers were available from 20 farmers, actually involved less than half this number of rabbits which were of sufficient weight, health, quality, *etc.* Another past effort has been the freezing and storage of meat, but this significantly increased the purchase cost to buyers when the equipment cost was considered.

A recent interest involves the traditional smoke-dry processing of rabbit meat. This product can be stored without the need of equipment or facilities. In the marketplace, there is a strong demand for smoke-dried meat products, such as beef, bushmeats, fish, and shrimp. Soon, HPI will be initiating a pilot project to determine the development and market success of this product. If successful, HPI will be recommending this processing method to farmers from other village projects as a means of increasing farm income. Obviously, this development, if realized, would justify the expansion of breeding animals on farms. However, if not realized, HPI might consider providing an additional animal enterprise to make a more significant

economic impact. For example, a young goat or pig and a trio of breeding rabbits could be provided to a needy family. In time, while rabbit meat would be consumed regularly, the income gained from the sale of the goat or pig would be reinvested.

A noteworthy benefit of the HPI-CAM rabbit program has been the promotion of gender awareness and empowerment. The survey report by AKOB *et al.* (1996) involved 15 villages in the NWP and 187 women respondents. Because women have the responsibility of family nutrition, there is a strong interest in livestock projects. The survey revealed that rabbits ranked number one among 12 livestock species choices since rabbits were known to be fed and managed near the home, to entail low production costs with early benefits of meat and income, to require little space, and to be easily slaughtered. Rabbit manure combined with alley cropping of agroforestry species (*e.g.*, *Caliandra* and *Leucaena*), have helped women produce better gardens. In the HPI-CAM rabbit program, income from rabbit sales is more apt to be spent by women on better food, clothes, school books, and medicines, whereas men are more likely to spend the money on luxury items (AKOB *et al.*, 1996), as is generally the case in less developed countries (MILLER, 1995). In addition, HPI-CAM staff have encouraged spouses to co-sign contracts (as a symbol of solidarity and gender empowerment) involving the "Passing on the Gift" (POG) in which offspring from original rabbits loaned to the women farmer from HPI have been, in turn, loaned to a newly trained farmer.

Technical Aspects of HPI-CAM Rabbit Program Management.

The HPI-CAM staff are a highly professional and capable team with considerable knowledge and experience in developing successful rabbit projects for poor families in villages. They prefer field work over office work, and enjoy the heartfelt rewards associated with helping people one-on-one through development projects. However, they maintain highly demanding schedules in conducting training, supervision, reporting activities, *etc.* The very nature of rabbit projects, whereby the loan of breeding stock to trained farmers may lead to POG rabbits for new farmers in less than 6 months-time, is a particular challenge. Hence, not to mention the large amount of time involved in travelling to often remote project village sites, there is essentially a vacuum that requires HPI staff to devote additional time to monitor new POG rabbit program activities. There is a need for HPI staff to provide more frequent quality time with farmers to ensure project success. This emphasis can be met, in part, by limiting the number of new rabbit projects, so that existing projects can be made more manageable. In particular, HPI field staff should prioritize efforts to improve feeding

Table 3 : Rabbit program recommendations to HPI-CAM based on consultation

1. Make more frequent visits to farmers. Focus especially on improving feeding practices.
2. Identify and solve basic problems on farms during visits. Plan a follow-up visit if necessary.
3. Establish forage plots to provide a secure feeding resource for the rabbits.
4. Continue priority focus on rabbit projects involving the social empowerment of women.
5. Assess the feasibility of rabbit-goat or pig package as a means of nutritional-economic aid.
6. Keep rabbits indoors in rooms or sheds to reduce kit mortality. Also, encourage farmers to place hay in nestboxes to prevent neonatal deaths.
7. Initiate a pilot project to determine the feasibility of processing and marketing of smoke-dried rabbit meat by farmers.
8. Importations of rabbit breeds is not recommended as the local stock appear to be adaptable and productive.
9. Develop local rabbit farmer leader expertise to assist in project coordination and farmer supervision activities.

practices on farms. The rate of adoption of these practices can be enhanced through the establishment of forage plots. Moreover, HPI needs to groom potential farmer leaders in villages so that local expertise is made available and that rabbit projects succeed in the long run.

In conclusion, the consultant was generally impressed by the progress of the HPI-CAM rabbit program and the special team who is truly dedicated to the mission of poverty alleviation and social empowerment. While tremendous achievements have been realized by farmers through the HPI-CAM rabbit program, the present shortcomings mentioned in this report are certainly only temporary. It is most inspiring that HPI-CAM views rabbits as the highest priority intervention among other livestock projects in providing rapid relief to impoverished people in Cameroon.

Acknowledgements : The consultant wishes to sincerely express his gratitude to the HPI-CAM staff for making all the necessary arrangements to ensure that the consultancy mission was most effective. Gratitude is also expressed to Kelly Rollon for assisting in communication and travel arrangements and to Dan Gudahl for the invitation and the financial resources to make this trip possible.

Received : January 22nd, 2000

Accepted : April 17th, 2000

REFERENCES

- AKOB J.M., NJWE R.M., NIAKOI H.N., 1996 : Women in livestock development: The case of HPI/Cameroon. *In: Proc. Workshop on Gender and Family Focus, Gweru, Zimbabwe, September 30-October 4, 1996, pp 95-106. Heifer Project International.*
- CIA. 1999 : Central Intelligence Agency home page. Available at <http://www.odci.gov/cia/publications/factbook/cm.html>. Accessed September 19, 1999.
- GENKAHA F.F., 1997 : The socio-economic impact of Heifer Project International (HPI) supported small holder rabbit projects in Mankon village. *Diplome D'Ingenieur thesis, University of Dschang, Cameroon.*
- HOFFMANN I.M., KOBLING S., STIER C.-H., GALL C.F., 1992 : The potential of rabbit meat marketing in Bobo-Dioulasso, Burkina Faso. *Livest. Res. Rural Devel.* **4** (1),1-8, (HTML version, pp. 8).
- KONGYU F.A., 1998 : Reproductive and growth performance of rabbits with small-holder farmers in the NWP supported by HPI/Cameroon. *Diplome D'Ingenieur thesis, University of Dschang, Cameroon.*
- LEBAS F., COUDERT P., ROCHAMBEAU H. de, THEBAULT R.G., 1997 : The Rabbit : Husbandry, Health and Production. (2nd Ed.). *FAO. Rome.*
- LUKEFAHR S.D., 1983 : Report on the identification and distribution of breeds of rabbits in the Cameroon. *Internal report of Heifer Project International, Bamenda, Cameroon.*
- LUKEFAHR S.D., 1998 : Rabbit production in Uganda : Potential versus opportunity. *World Rabbit Sci.*, **6**, 331-340.
- LUKEFAHR S.D., CHEEKE P.R., 1991a : Rabbit project development strategies in subsistence farming systems. 1. Practical considerations. *Wld. Anim. Rev.*, **68**, 60-70.
- LUKEFAHR S.D., CHEEKE P.R., 1991b : Rabbit project development strategies in subsistence farming systems. 2. Research applications. *Wld. Anim. Rev.*, **69**, 26-35.
- LUKEFAHR S.D., GOLDMAN M., 1985 : A technical assessment of production and economic aspects of small-scale rabbit farming in Cameroon. *J. Appl. Rabbit Res.*, **8**, 126-135.
- LUKEFAHR S.D., OPOKU E.M., ATAKORA J.K.A., 1992 : Heritability of 90-day body weight in domestic rabbits from tropical Ghana, West Africa. *J. Hered.*, **83**, 105-108.
- MILLER B., 1995 : The role of women in animal husbandry. *In: Proc. 8th Conf. on Livestock Production and Diseases, Berlin, September 25-29, 1995, II, 593-598.*
- NRC, 1991 : *Microlivestock*. National Academy Press, Wash., D.C., National Research Council. 449 pp.
- NUWANYAKPA M., LUKEFAHR S.D., GUDAHL D., NGOUPAYOU J.D., 1997 : The current stage and future prospects of guinea pig production under smallholder conditions in West Africa; 2. Cameroon case. *Livest. Res. Rural Devel.* **9** (5),1-12, (HTML version, pp. 12).
- OWEN J.E., 1981 : Rabbit meat for the developing countries. *Wld. Anim. Rev.*, **39**, 2-11.
- RUSHTON J., NGONGI S.N., 1998 : Poultry, women and development: Old ideas, new applications and the need for more research. *Wld. Anim. Rev.*, **91**, 43-48.