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RABBIT PRODUCTION IN DEVELOPING COUNTRIES

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The reference to Developing Countries is a very rough classification based on the level of industrialization, economic standard and social welfare reached by some countries in comparison to the more developed ones.

Rabbit breeding in Developing Countries is something more difficult to be defined since breeding conditions can be very different in various geographic areas and frequently, in the same area, primitive systems of breeding can exist side by side with very sophisticated ones.

To try to put in evidence common traits, the first one is the absolute predominance of small family breedings mainly oriented to autoconsumption.

Recent statistics in France (Sinquin, 1991) show that in this country, which must be considered among the most developed ones, rural breeding is still very diffused. In fact, 97.1% of the breeding in 1988 was represented by unities with less than 20 does and a mean of only 4 does. The number of does in these very small breedings was 58.6% of the total. If also the breedings until 50 does are considered (mean 26 does), the proportion of breedings rises to 98.6% and the animals to the 64.3% of the total.

On the contrary, the breedings with more than 500 does were less than 0.1% and the corresponding animals were only 4.1 percent. The examination of the French statistics in the year 1983 (Henaff et al., 1984) shows that the proportion of small breedings has remained unchanged in the time and this is a demonstration that the setting up of some mean or big breedings cannot easily change the breeding structure of a country.

This premise is to demonstrate that, if this is the situation of the rabbit industry in a developed country, industrial breeding in developing countries must be considered absolutely marginal though many examples could be mentioned.

This is a not negative trait. In fact industrial breeding is a capitalistic system with many financial resources exploited by few persons producing for the big town markets where only relatively rich people can purchase; on the contrary the small rabbit breedings, which sustain the economic and the nutritional level of thousands and thousands of families, have a much more social relevance. This point is very important to be considered when development programmes are studied.

With these elements it can be put forward a first question. As to say, if it is useful to try to transfer to a Developing Country the high technology of sophisticated industrial systems, or both research and development programmes must be devoted to increase

efficiency and multiply the number of small (still very small) familiar breedings.

It can be now examined what is and what could be the economical impact of rabbit breeding on a world-wide scale.

Lacking of statistics, the only possibility is to try to get the best use of the few available information and work up an estimation of the minimum possible of rabbit breeding entities and discuss then about real or potential production.

Human population of all Developing Countries is estimated about 4165 millions: 74% Asia, 10% Centre and South America, 3% Arab Africa, 12% Black Africa (Ist. Geografico, 1991).

Asia, where rabbit arrived through the Silk Road (Zhang, 1990) if not much earlier, going back to 1000 B.C. (Li, 1988; Chen and Wang, 1991), and Arab Africa, where possibly rabbit was originated (Rougeot, 1981), have a very old tradition in rabbit breeding and rabbit meat is very appreciated and frequently used in religious or social feasts. In the other countries, the diffusion of rabbits was a consequence of colonization from people like Spanish, Portuguese, French and also Italian which are people by which rabbit breeding has an old tradition and a wide diffusion.

Centre and South America were favoured because present population has a big Iberian component and from other Mediterranean countries, and they maintained their original nutritional habits (De Sanctis Viana L., 1988). Local population already knew and hunted for eating different rabbit species (Sylvilagus, Romerolagus) or, in the Andean area, had already domesticated the guinea pig that is called "conejo" (rabbit), when speaking Spanish, to distinguish it from the true rabbit which is called "conejo de Castilla" (Spanish rabbit). The convergence of breeding attitude and alimentary customs made it easy to develop rabbit breeding in Centre and South America.

Also in Black Africa rabbit was imported during the colonial period but its diffusion was not favoured by the local populations which had not a similar breeding and nutritional experience. But the 12.5% of Black Africa population is not such to modify the general judgement that rabbit breeding is well diffused in Developing Countries and contributes to their economy.

The only random statistic on number of families breeding rabbits is the one made in the villages of southern Tunisia at the limit of Sahara desert where rabbits were found present in 59,2% of families, as to say as much as poultry (59.6%); 43.3% had rabbits and poultry together (Finzi et al., 1988). Such an high figure (60%) is also the percentage of farmers raising rabbits in 6 counties of Sichuan Province and most of them are considered keeping 20 to 50 does (Pu and Pelant, 1990).

Supposing a mean family is formed by 10 persons and hypothesizing that at least 10% of them breed rabbits, it can be evaluated that not less than 41.6 millions of families are involved.

This is a very prudent evaluation, considering that rabbits are bred not only in rural areas, as a part of the backyard economy, but also they are present in the very extended suburban districts where they are an important subsistence mean (Hoffman 1989; SAHR/SINESA, 1990), more or less as it happened in European towns to cover nutritional

deficiencies during the last world war.

The consistency of flocks present in these breedings could be of about 5-7 adult heads, since a mean of 5.0 has been found in urban and rural area in Burkina Faso (Adelhelm et al., 1987) 6.2 in the rural area in Tunisia (Finzi et al., 1988) and 5.5 in the suburban districts of Mexico City (Finzi, 1991). In Asia where it is settled the 74% of population of Developing Countries and breeding tradition is very old, the mean dimensions of breedings are probably higher; many peasant households are engaged in rabbit raising as a main source of income and raise 50-100 does or more (Zhang, 1989). A total of 210 to 290 millions of does could then represent a minimum for the total of Developing Countries, and twice as much looks still as a valuable estimation. These figures are 10 (or 20) times higher than the ones calculated by Lukefahr (1985), based on an estimation of Lebas et al. (1984). At that time also the present estimation, based on human population and possible percentage of breeders, should be lower but not so much.

The importance we can attribute to these figures depends on the point of view. One doe per 15-20 persons does not look very much; a figure of 1 doe per 7 persons can be calculated from the official statistics of Sichuan Province which is considered to have the highest density of rabbit breedings in China (Pu and Pelant, 1990). These proportions look still poorer considering that productivity is frequently very low (Lebas, 1983; Gaspari, 1984; Lukefahr and Goldman, 1985; Finzi, 1986; De Sanctis Viana, 1988; Finzi et al., 1988; Kennou, 1989). But supposing that, with the help of an appropriate research, a mean of 10 rabbits could be produced per doe per year, thus a breeding of 5 does can provide one rabbit per week for selling or autoconsumption, and this quantity appears to be a substantial contribution to cover the family needs.

These considerations bring to another question about the importance to individuate some geographical areas to be regularly monitored for number of breeders and dimension and productivity of breedings. To get a better knowledge of real field conditions should permit to prepare development programmes based on realistic data and to test their effect in the time.

The influence of the European Countries in the diffusion of rabbit breeding is well evident if it is observed how the technology they previously developed, as to say the cage, high productivity breeds (and more recently commercial hybrids) and balanced integrated pelleted feed are normally the base of all the programmes to support the development (Kamel and Lukefahr, 1989; Bhasin et al., 1989; Kamel, 1990).

But local people have produced its own technology widely based on a) free range in colonies, (Kentor, 1990; Kennou, 1990a) b) using local breeds (unluckily today frequently crossed with exotic rabbits) (Khalil and Khalil, 1991; Opoku and Lukefahr, 1990; Pu and Pelant, 1990) and c) feeding animals with grass cropped by the breeders and administered with or without some integration (Rahario et al., 1986; Rastogi, 1986; Afifi and Khalil, 1989; Zhang, 1989; Ajala, 1989; Kamel, 1990; Deshmukh et al., 1990; Mutetikka et al., 1990).

Other points of discussion are thus about: a) technologies that should be compared both by the side of productivity and by the side of the economic results; b) breeds which should

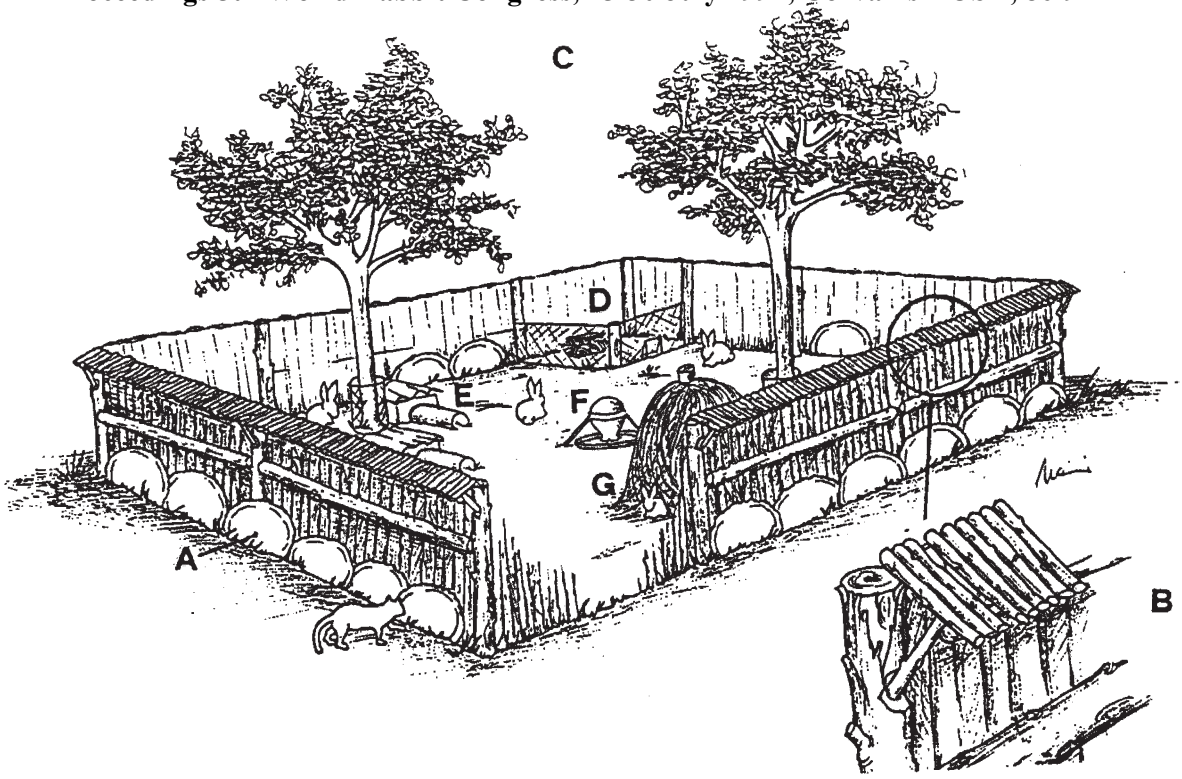

Figure 1 - Project of a fence for free range rabbit breeding. A: Tank bottoms to strengthen the fence. B: Upper outward projection against climbing predators. C: Trees to provide shadow (and in case edible leaves). D: Capture contrivance. E: Explorable nest: F: Clay waterer. G: Haystack.

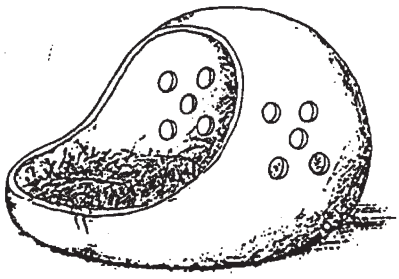

Figure 2 - An original baked clay nest (Bourkina Faso).

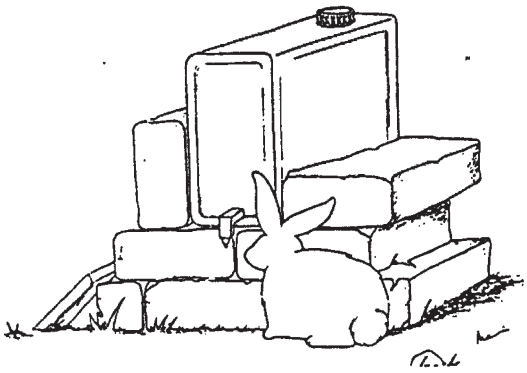

Figure 3 - A simple waterer has been made inserting a nipple in a plastic container (Tunisia).

be thoroughly studied to evaluate correctly their genetic potentiality and to complete the inventory for conservation of rabbit germoplasm resources. Rabbit descriptors for data bank entry have been reported by Lukefahr (1988). Many information at this purpose are already available for the Chinese Sichuan White (Pu and Pelant, 1990); the Egyptian Giza White and Baladi red (Afifi and Emara, 1985, 1987; Shafie et al., 1982); the local Tunisian (Kennou and Bettaib, 1990); c) to complete the information available on feeding with grasses and leaves and possible integrations (Kennou, 1990b; Aganga et al., 1991; Biobaku, 1991) to improve an organic compilation of the matter for a valuable extension work in behalf of small breeders looking for a low cost rabbit feeding (Lebas, 1983; Schlolaut, 1985; Fekete, 1985; Aduku et al., 1989; Deshmukh et al., 1990; Omale, 1990).

For what attains technologies, a project for a small fenced warren is represented in figure 1 as an example of the result of observations of local technologies originally developed in the field, and integrated through research to improve the feeble points and set together to produce a coherent system able to compete with cage breeding, at least in certain environmental conditions.

It is easy to understand how many problems have to be solved don't to get out of the limits of capability of local handicraft and to use locally available materials.

To enumerate some of these problems that it is worthwhile to discuss the following points can be taken into consideration:

1) What is the best fence and what is the strongest system to tie together the sticks;
2) How must be protected the base of the fence from rabbit gnawing and digging by the inside and from prey animals breaking through pushing by the outside.
3) How must be protected the top of the fence to forbid cats or mangoosts enter and prey the rabbits;
4) What kind of feeder, rack, drinker, nest-box should be adopted and produced by local handicraft.
5) How can the animals be caught (trapped) to control them.

And from the managerial point of view it should be discussed:

6) How can data be recorded in a colony system.
7) What kind of breed must be chosen
8) What kind of feeding must be adopted.
9) How must bucks be managed (always present; periodically present; does mated outside the colony).

The reference to local handicraft and material is important. As long as it is possible it should be avoided to depend on importing and also buying should be reduced to a minimum if self-making is possible (Kentor, 1990; Opoku and Lukefahr, 1990). It must be remembered in fact that, at the level of family economy, very frequently it cannot be spent for the animals what it is not enough for human needs. On the contrary there is frequently plenty of time and things can be produced in the place.

A good example of handicraft made in Burkina Faso with local material is the baked-clay nest box represented in figure 2. It looks very well studied with its holes to improve air circulation. It is cheap, clean, washable and functional.

An original solution for a drinker is shown in figure 3. It is possible sometimes to find water nipples but it is more difficult and expensive to find the water pipes or running water, may be, is not available and it must be brought with a bucket. The nipple inserted in the plastic container invented by a Tunisian breeder looks as a good alternative to the syphon system and more easy to be used. A good feeder for minimal wastage of unpelleted concentrates was designed by Kentor (1990).

These examples show that many useful tools could be found as produced by local technology and it should be discussed the opportunity to cooperate to make an inventory of all the simple or complex technologies to have the possibility to choose appropriate tools according to different conditions which can be found in extension work. Also the old fashion barns and cages of the colonial period must be considered since they present many advantages (Finzi, 1986; Kentor, 1990).

Many Developing Countries are situated in the equatorial and tropical area where climatic conditions are not relatively mild as in France, Northern Italy and coastal Mediterranean areas of Spain where rabbit breeding has most developed.

Yet in the first eighties Shafie et al. (1982) had understood the importance of testing rabbits (Giza White) putting in relation productivity and climatic factors (artificially produced). This line of research is useful to get theoretic information and both local and exotic breeds must be compared in the same stressing conditions.

The same research must be made in the field where many factors do present reciprocal interference. The analysis of these factors must lead the research to solutions which have to be simple, cheap, available and sustainable.

The genetic aspect also must be studied taking care of fitness to local conditions. This has been done in the formation and selection of the synthetic Chinese Saibei breed (Yang Zh., 1991) or in the project for a synthetic tropical rabbit breed in Ghana (Opoku and Lukefahr, 1990) where it was well stated that natural selection for higher mature weights, smaller litter size and fiewer litters produced in a year are conservative measures that enhance survival of rabbits in less-than-optimal environments, such as in the tropics and arid regions of the world.

In summary the topics which are more worthwhile to be discussed are:

1) Industrial or rural breeding;
2) Transferred technologies or simple technologies built up by the small breeders;
3) Monitoring of rabbit breedings in representative areas to study the effects of programmes for development;
4) Efficiency of local breeding systems (mainly colony systems) and evaluation of the economic results.
5) Inventory of local handicrafts;
6) Evaluation of local breeds and comparison with exotic breeds in true field conditions, mainly when hard climatic direct and indirect (feeding) constraints are present;
7) Selection of local breeds in field conditions with particular reference to fitness.
8) Feeding technology with roughage and possible integration of available feedstuffs.

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