

PROBLEMS OF RABBIT PRODUCTION IN DEVELOPING COUNTRIES

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Rabbit breeding is practised more or less in all the developing countries. This is true also when the general conditions are not the best ones to favour this activity, and in zones where people think rabbit are not bred at all, it is still possible to demonstrate that this believing is due to lack of information and breedings can be found and sometimes they are present in the area since a long time, and are ruled at a relatively good level.

Apart Asia in which rabbit breeding is traditional, normally the beginning of this activity is favoured by some preliminary external factors while the local conditions determine the possibility of a subsequent development. Since local conditions can undergo some changing, this means also that, with the time, the influencing factors can evolve in a favourable sense but, unluckily, also towards the decline of a yet flourishing activity.

The analysis of the conditions which favour the rising and widespreading of breeding activities is very

important since programs can be set in favour of developing countries and, to avoid failures, the influencing factors must be known and exploited or contrasted in the right way.

It is common to find that a rabbit breeding, even small and put in place for any reason, can move the interest of local people which can sometimes try to become breeders themselves to get some meat supply for the family or some small income.

The example is thus a very strong impulse to widespreading of the activity of raising rabbits. As a matter of fact this phenomenon has been observed paradoxically also when the rabbit breeding was put in place not for economical reasons as, for instance, in case of support for research or to produce vaccines, etc., but the most common case is the one of breeding for private use operated by european people, mainly the ones where rabbit breeding is traditional, so that the influence of portuguese, french and italian is very evident in the African continent and the spanish one in Central and South America.

Since these breedings are based on the imitation of the original ones, the european influence is frequently evident but it happens also that local technologies are developed and sometimes they are very original and can represent a progress in comparison to the local conditions.

The natural widespreading of the rabbit breedings is facilitated by the limited cost of animals and structures and by the relatively easiness to find the necessary daily feed in a limited amount. Also the possibility to make a part-

time activity has to be considered positively since it permits to integrate the income in a satisfactory way. In the developing countries, rabbit breeding should be done by the family rising small unities which could eventually be increased if the general conditions are convenient.

The small breedings can be conveniently developed not only in the villages but also in the towns where, may be, feed is most costly but the marketing of meat is easier.

Of course it is possible to find also in the developing countries many industrial breedings, built as pilot projects or as State farms and also pertaining to private investors. But the general impression is one of not viable structures operating with small profit if not any.

The most common constraint, which makes very vulnerable all the industrial rabbitries, is the lack of infrastructures. These regard the financial means; the availability of locally produced buildings and means to regulate the environment. The latter request pieces to be replaced and a good technical service to keep them going, not to lose the productivity and even the animals in hot periods. The same can be said for the necessity of an energy supply which can't be disrupted for any reason. It is necessary at least one mill farm able to produce a continuous supply of a good quality pelleted rabbit feeding and a selection centre to provide animals is desirable.

Also it is necessary a wide market, good roads, a slaughter house and a freeze system from production to selling since the marketing of live animals can't be sufficient. The

veterinary service and a good supply of therapeutic and prophylactic means also have to be present.

It is easy to observe that very seldom it is possible to find all these conditions together. When an organic infrastructure system is present, a country is on a good way to development and small or big rabbit farms can be put in work with very high probability of success.

A situation like this has been observed, for instance, in Egypt, in the area between Cairo and Alexandria, which is in a phase of quick development / Finzi, 1987 /. But this situation is not common and an industrial system should not be normally envisaged or it should be taken into consideration very prudently.

It is evident that small breedings are not very threatened by a feeble infrastructure system; only they are forbidden to grow over a certain limit. But also constraints to small breedings do exist and they are not conveniently studied. Unluckily we can only enumerate them and it is not sure the list is exhaustive.

First of all we have to consider the geographical conditions which influence green feed production / Cheeke, 1983; Jham et coll., 1987; Rastogi, 1987; Finzi, 1986b, 1987, 1988a /. In Africa and South America there is a very wide equatorial area with rains all the year long which is very convenient for rabbit breeding at a very low cost of production. Other favourable conditions are along the rivers, in the oases and where irrigation programs are developed. But

geographical conditions not suitable to a continuous rich green production constitute a very important limiting factor.

The climates with prolonged hot periods are also a very limiting factor, temperate only by altitude. This brings to the conclusion that most of developing countries have climatic conditions with hot dry seasons which limit strongly rabbit breeding.

If we can distinguish between tropical climates rich or poor in feeding resources, as to say favourable or unfavourable to rabbit breeding, it is not the same about what attains temperature.

High temperatures are always a very hard limiting factor / Casady et coll., 1962; Gonzalez et coll., 1971, 1974; Nichelmann, 1972; Nichelman et coll., 1973; Prud'hon, 1976; Eberhart, 1980; Matheron and Martial, 1981; Kadlecik, 1983; Whaley, 1983; Camps et coll., 1985. / . This is because in free conditions rabbits dig their burrows and hide in the fresh deep of the holes during the hot hours of the day, getting out to graze in the late afternoon and during the night. This behavioural defence against heat has taken away the animals to the natural selection for a more efficient capability of physiological body heat dissipation.

In fact sensible heat dissipation is impaired by the dense fur with only the exception of the internal ear surface, and the quick and high increasing in respiratory rate can't avoid the rising of body temperature when the ambient temperature is over 25 °C.

When ambient temperature is about 28 °C male fertility is impaired /Chou et coll., 1976; Moller-Holtkamp et coll., 1976; Waites, 1976; Blume et coll., 1977; Battaglini and Costantini, 1985; Bagliacca et coll., 1987/ and at 35 C some subjects begin to die. Since in tropical climates these temperatures are very easily reached, it is understandable that the cage breeding system, which is very commonly adopted, represents a not appropriate technology since forbids the rabbits to save themselves from the unfavourable environment and obliges them to remain exposed, without any defence, to the noxious effect of heat.

Local breeding technologies, based on the possibility given to rabbits to dig underground, are not infrequently observed and they must be considered more efficient, with respect to environmental conditions, in comparison with cage breeding. They are also cheaper, so that it is not justified to consider them as primitive systems to be abandoned. On the contrary they have to be studied and improved and compared with the field results obtained with cage breeding to arrive, at the end, to a more objective evaluation.

Doubtless some improved systems already exist as the deep pit system observed in Tunisia, in which a sensible reduction of ambient temperature is obtained /Finzi et coll., 1988 a / .

Also free range warrens can be utilized as it happens in Cabo Verde islands and in Guinea. This system seems to be of Portuguese origin and it was known also in the time of Romans.

It has been improved after a five year research in Viterbo /Finzi, 1986c/ and begins to become competitive also in Europe, thanks to the low investment costs and the possibility to exploit no value marginal land.

Another system with underground cells has been developed in U.S.A. and it seems susceptible also for intensive breeding /Gentry, 1983; Finzi, 1987/.

All these examples confirm that a long way has to be done in the field of appropriate technologies in behalf of rural development with some chances also for industrial breedings, where very favourable general conditions are present.

A problem which is frequently considered is on the more convenient breed to be bred in tropical countries. But this is, in reality, a minor one. A part some more or less well fixed geographical breeds /Ghany et coll., 1969; El Amin, 1978; Lukefar and Goldman 1985; Wanjaiya and Pope, 1985; Afifi and Emara, 1987 / we know that the so called local breeds are mostly exotic breeds which have been imported, sometimes since a long time, and have been subsequently indiscriminately crossed so that a great morphological variability was produced.

When the climatic and nutritional conditions are not good, reduction of size is normally observed (frequently the weight of the adult subjects is no more than two kilos) and conformation changes back to a more slim shape. This makes probably the animals best adapted to hot environmental conditions and the lighter weight makes it easier to cover the

maintenance nutritional needs. Thus to import heavy breeds, as it frequently happens. / Owen, 1981 / has to be considered nearly always as a mistake, unless experimental results can show that conditions which permit the utilization of such breeds do exist.

For this reasons the best thing to do is not to bother at all about breeds, until the general breeding conditions are improved. If this happens we can try to improve the productivity of the local adapted animals or to improve the adaptation of exotic more productive breeds. In both cases it is sufficient to select on the base of reproductive capability (number of weaned) to arrive to the same result, as to say probably to rabbits of smaller size not exhausting their capability of adaptation with a too high productivity.

To do this it is sufficient to record some data on proper does fiches. The breeders themselves could provide, thought it is well known how difficult it is to convince people to record regularly the production parameters. But this point can't be avoided, since it has been demonstrated that the simple fact of recording data determines an increasing of the productivity through a better knowledge of the animals which permits the elimination of the unproductive ones and a better exploitation of the others. Anyway this is a point where research could do a very profitable work and the genetic aspects of thermotolerance should be one of main points at this purpose / Finzi et coll., 1988 a, 1988 b /

The exploitation of rabbits should be normally extensive or semi-intensive if feeding conditions are rather

good. With a feeding not proper in quality and quantity, and with a reduced intake due to hot climate, the does should not be obliged to sustain contemporary the double effort of gestation and milking, and also the prolificacy of exotic breeds seems excessive in relationship to milk production available with poor feeding conditions.

It is thus very surprising to notice that capability of does to accept mating even immediately after delivering is well known in developing countries so that, to exploit the better male acceptance and higher fertility of this period, an intensive reproductive rhythm is frequently imposed to does. Of course the results, as far as we know, are very bad since an intensive reproductive rhythm is very difficult to be practised even in the best conditions of the most sophisticated technology.

To produce something is better than to produce nothing, thus it has to be posed a goal of no more of 4-5 deliveries per doe per year, each of them able to give 4-5 rabbits ready to slaughter, considering the usually high mortality. And this should be a very good result in comparison to the real observed ones which are normally much more poor than this /Lebas, 1983; Gaspari, 1984; Lukefahr et coll., 1985; Finzi, 1986b, 1988a/

With this productivity, a family rising three does can get more than one rabbit a week, which is a very good result. And this can be obtained with a very small investment at low cost of production (few concentrates to lactating does)

and nearly only the work to collect grass or branches every day for rabbit feeding.

About nutrition, in 1986 three tables specific for rabbits had already been published /Schlolaut, 1982; Maertens and De Groote, 1984; Finzi, 1986a/. According to the last one, information regards 170 feedstuffs, many of them of tropical origin, but the number has continued to increase since then.

Paradoxically it has been noticed that most of the information is not utilized in developed countries, which limit formulations for industrial purposes to a very small number of items, but in the developing countries most of them could be properly utilized by small rabbit unities localized near the place where available byproducts are produced /Finzi 1986a./.

A good deal of work has to be done at this purpose since, while we know enough about nutritive value of many feed stuffs, we know nearly nothing about collection, conservation, quantities to be daily administered and best possible integrations.

The over mentioned are the most important problems to take into consideration. The analysis of systems, which should always properly done before starting with any developing program, shows frequently other minor conditions which should be considered. For instance we have observed problem of cultural, social, economical and even political origin.

To give an example the andine autochthonous populations have some difficulty to breed rabbits, and this

has a cultural origin since they are accustomed to raise guinea pigs which live in small colonies and give not mating nor nest problems, so that the single cage breeding and the need to control mating and gestation, in order to put the nest, are more difficult to be understood than from other people which never had such experience. And since guinea pig is also a traditional food, the idea to make programs to introduce rabbit, instead of improving guinea pig breeding, seems not the best one /Vietmeyer, 1985/.

Another example about importance of culture is given by Sao Tomé populations, a part of which was immigrated from Cabo Verde islands where they had learnt, since generations, to breed rabbits by portuguese. For a strange combination of economical and cultural factors, the people from Cabo Verde have a very high competence in rabbit breeding, but, because of a quick decline of agricultural activity in which they were employed, they are now so extremely poor not to be even able to buy the nails to build the cages. As a consequence, lacking any effort to develop the economy of this ethnic group, all the competence in rabbit breeding will be lost in the island /Finzi, 1986b/.

Social aspects should be also considered. A program for developing family breedings could consider autoconsumption as a first step and, in this case, the role of women could be very important, while men should be more involved in a second step devoted to breeding for commercial purposes /Finzi, 1988b/.

To consider the political aspects, not all the governments have a specific interest to develop rabbit breeding in behalf of populations while others have developed special programs /Owen, 1981/ and this is also a factor which can be very important to produce a success.

If industrial breeding is possible, research has already produced any type of information at this purpose, so that all the research in behalf of developing countries should be devoted to small-scale family consumption or market-oriented rabbit production /FAO, 1981; Cheeke, 1983; Lebas, 1983; Lukefar and Goldman, 1987; Rastogi, 1987 / and this should be done starting from the study of real conditions, local technologies and people needs, leaving aside the simple transferring of sophisticated technologies which, may be, gave many hopes, but very rarely produced practical advantages.

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