

THE TUNISIAN NOT CONVENTIONAL RABBIT BREEDING SYSTEMS

A. Finzi \*, A. Tani \*\*, A. Scappini \*\*

\* Istituto di Zootechnia, Facoltà di Agraria, 01100 Viterbo,  
Italy

\*\* Istituto Agronomico per l'Oltremare, 50131 Firenze, Italy

INTRODUCTION

Rabbit breeding projects for developing countries are normally based on the typical cage system, and this happens also in tropical climats where exposition to high environmental temperatures determines a lost of productivity for three, four months or more, due to long lasting infertility /Blume et al., 1976; Chou et al., 1976; Waites, 1976; Moller-Holtkamp et al., 1979; Rastimeshin, 1980; Roca et al., 1980; Castellò, 1984; Kadlecik, 1984; Battaglini and Costantini, 1985; Bagliacca et al., 1987/ and to sudden death of the animals, depending on the very feeble capability of thermoregulation of the species.

In nature, the defence against heath is typically behavioural and rabbits, during the hot day hours, hide in the burrows digged in the ground getting out to graze only during the fresh hours from sunset to dawn. As a consequence it is evident that the conventional cage breeding is a strong restraint to the free manifestation of rabbit biology and a cause of the observed impaired reproductive rate.

But not conventional systems do exist; they are the expression of the local technology and they have to be described and studied since they could be improved and, at the

end, give better results than the conventional cage system.

A research in the Nefzaoua oasis territory in Tunisia has put in evidence that many different breeding systems do exist. All of them are based on the common point to permit the rabbits to dig their underground burrows or to imitate this situation building directly underground rabbitries.

#### MATERIALS AND METHODS

A research have been done in the Nefzaoua region in Tunisia. This region is characterised by an oasis system where dates palms are cultivated.

At the feet of the palms a rich alfalfa production is obtained, thank to an abundant water supply and this is the basis of the feeding for many rabbit breedings present near the houses.

Over 266 random interviews, rabbit breeding has been found in 59% of the families and the importance of the species is underlined by a numeric proportion of 73% to 27% in comparison to fowl /Finzi et al., 1988/.

In this very favourable conditions some not conventional rabbit breedings have been observed and described. To evaluate their suitability, microenvironmental temperature has been measured and the number of young subjects present has been taken as an index of reproductive efficiency. The measurements were taken on the second half of september when it is at a maximum the negative effect on reproduction.

#### RESULTS

All the observed breeding models exploit the better microenvironmental conditions which can be found underground.

The most common system consists in a rectangular pit, wide from m 0.5x0.8 to 1.0x1.5 and deep m 0.4 to 0.7 (fig. 1A). It

is protected by a small brick or stone wall and covered with wood, metal or other materials. From the bottom of the pit the rabbit dig their burrows where they rest during the day to get out to feed in the bottom of the pit only when necessary.

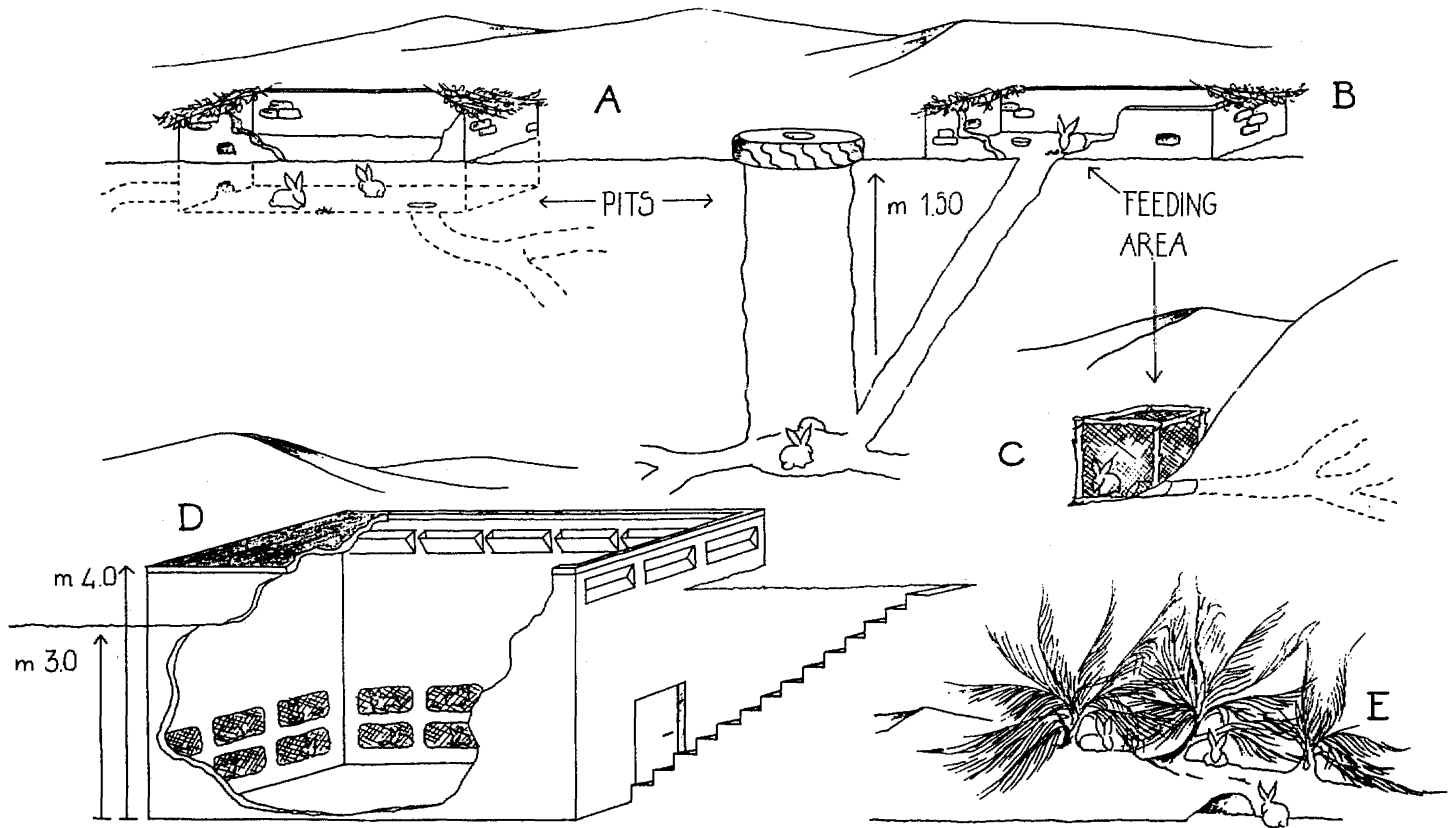
A more evolved system is based on a circular pit wide m 0.6-0.4 and deep about m 1.5 and sometimes more (fig. 1B). From the bottom of the pit a very steep oblique burrow heads to a feeding area at surface level where the rabbits can be easily caught closing with a stone the mouth of the burrow.

Another very interesting possibility is to utilize the side of an old dune in which the sand has been hardened with the time. To make the breeding it is enough to insert a piece of tube in the side of the dune and to protect with a net a small area around it with function of feeding zone (fig.1C). Starting from the tube the rabbits dig their burrows inside the dune where they find repair during the hot day hours.

It was also observed a breeding with rabbits completely free digging their burrows under a bush (fig.1E). The animals were watered in a bowl and fed in front of the holes and in a little box were they could be eventually caught.

All these types have the common parameters to be colony systems in which the reproductive traits are difficult to be controlled. They are small systems (3-4 doews and 1 buck) generally to produce for family needs.

It interesting that also the only observed breeding for commercial purposes (35 doews) was built 3/4 underground (fig. 1D). Instead of the cages 44 single cells were obtained in the wall of the building. The dimensions of this were m 4x10 and m 4 high.



**Fig.1** - Main types of Nefzaoua rabbit breedings: A, Mean pit; B, Deep pit; C, Dune type; D, Partly underground rabbitry; E, Free system.

Table 1.- Ambient temperature and young rabbits present as direct and indirect indexes of the efficiency of the different breedings models at the end of summer.

BREEDING MODEL	OUTSIDE		INSIDE			Young rabbits per doe		
	sun	shadow	pit bottom or inside build.	cages or burrow mouth				
		A	B	C	B-A	C-B	C-A	
Deep pit	41.7	37.2	31.3	27.6	-5.9	-3.7	-9.6	3.0
Mean pit	44.0	35.6	32.0	28.4	-3.6	-3.6	-7.2	2.2
Surface burrows	41.5	34.6	31.9	28.8	-2.7	-3.1	-5.8	0.5
Partly underground building	40.9	33.4	28.2	28.0	-5.2	-0.2	-5.4	0.3
Normal building	40.0	34.0	31.2	30.3	-2.8	-0.9	-3.7	0.0

In table 1 the observed external temperature is reported and compared with the temperature inside the breedings. The number of small rabbits present is reported as an index of reproductive efficiency.

The data in the last column but one show that in the deep pit the decrease of the environmental temperature is nearly ten degrees centigrades and the positive effect becomes less sensible with the passage to less deep systems. The composition of this effect is analysed in columns 5 and 6.

In a period in which the external temperature was still about 33-37 °C in the shadow, as to say very stressing for rabbits /Gonzalez et al., 1971; Nichelmann et al., 1972, 1973; McEwen and Heath, 1973; Gonzalez et al., 1974/, the decrease of ambient temperature obtained without any artificial climatizing system is very important. In fact the data in the last column shows how reproduction is related to efficiency of the system in reducing the ambient temperature. The correlation coefficient was  $r=0.95$  with  $P<0.05$ .

#### CONCLUSION

The research shows that local technologies can produce environmental conditions much better than the ones in the conventional cage system. They are also simple and cheap so that they should be preferred in tropical countries as long as better alternatives will be demonstrated.

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#### SUMMARY

Some local rabbit breeding technologies of the Nefzaoua oasis region in Tunisia have been studied. They are based on the possibility of permitting the rabbits to dig their burrows underground or to build partly underground the breeding itself.

With these systems better ambient temperatures can be obtained in comparison with cage system and rabbit are less stressed and more reproducing. The described not conventional systems are very adapted to tropical climates. They are also simple and cheap and very convenient to small family breedings.

#### RESUME

On a étudié les technologies d'élevage des lapins dans la région des oasis du Nefazaoua en Tunisie. Elles sont basées sur le critère de permettre aux lapins de creuser leur terriers souterrains or de bâtir les clapiers partiellement enterrés. Ces systèmes permettent d'obtenir des températures ambiant beaucoup plus favorables que avec l'élevage traditionnel en cages et les lapins sont moins stressés et se reproduisent mieux.

Les systèmes pas conventionnels qu'on décrit sont très indiqués pour les élevages dans les climats tropicaux. Ils sont aussi simples, économiques et bien convenables pour les petits élevages familiaux.

