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## HYGIENIC-SANITARY PLAN IN RABBIT BREEDING BELONGING TO ITALIAN RABBIT BREEDERS ASSOCIATION (IRBA) SELECTIVE PROGRAMME: PRELIMINARY RESULTS.

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SUMMARY - Rabbit breedings belonging to Italian Rabbit Breeders Association (IRBA) selective plan have to follow a planned selective and hygienic-sanitary program.

The guidelines of the hygienic-sanitary program are aimed to planning and cycling of procedures and activities, correct use of drugs, animal welfare and biosecurity of production.

The control of correct use of veterinary drugs is performed by mean of samples collected in the farm 4 times/year for drugs residues search (fattening feedstuffs and drinking water).

The biosecurity of productive conditions is checked by mean of swabs (cages and equipment) for environmental zoonotic agents contamination and by mean of samples of ambient air.

After two years of activity, in one farm belonging to IRBA selective plan, we controlled the productive and hygienic level in order to evaluate the working of selective and hygienic program.

In a group of 147 preselected NZW rabbit does we tested 9 NZW preselected bucks using A.I.

All the reproductive-productive data (fertility, litter size at 1, 18, 60 days of age, live weight at 18, 60 and 78 days of age) and the results of the hygienic-sanitary monitoring have been registered and collected (% of culled and dead animals, positive results in environmental samples, drugs residues in feedstuffs and drinking water).

Preliminary results are presented and discussed.

*Key words: Rabbit breeding ; selective program ; hygienic-sanitary plan ; monitoring ; results .*

### PROGRAMME D'HYGIENE ET SANITAIRE DANS LES ELEVAGES DE LAPINS APPARTENANT AU PROGRAMME DE SELECTION DE L'ASSOCIATION ITALIENNE ELEVEURS LAPINS (AIEL) : RESULTATS PRELIMINAIRES

RESUME' : Le programme de sélection des élevages de lapins appartenant à Association Italienne Eleveurs Lapins (AIEL) doit suivre un programme sur le plan sélectif et sur le plan hygiénique.

Les lignes guide du programme hygiénique ont le but de surveiller les cycles de production, les procédures et les activités; de contrôler l'emploi des médicaments et de soumettre à un monitoring le bien-être des animaux et la bio-sécurité de la production.

Le contrôle du bon emploi des médicaments est effectué par des échantillons (aliment et eau de boisson) prélevés au sein de l'élevage quatre fois par an, qui sont en mesure d'établir les résidus éventuels. La bio-sécurité des conditions de production est inspectée par des tampons (cages et équipements) et des échantillons de l'air ambiant, qui vérifient la contamination par des éventuels agents de zoonoses.

Après deux années d'activité nous avons contrôlé le niveau de sélection et d'hygiène dans un des élevages appartenant à l'AIEL pour faire une évaluation du fonctionnement des programmes, dans un groupe de 147 femelles multipares présélectionnées et de 9 mâles de race NZW.

Toutes les données concernant la reproduction et la production (fertilité, nombre/mise bas à 1, 18, et 60 jours de vie, poids à 18, 60 et 78 jours de vie) et les résultats du monitoring ont été recueillies et enregistrés (% des animaux morts et éliminés, résultats positifs par contamination microbienne et/ou contamination des résidus).

Ici on présente et on discute les résultats préliminaires obtenus.

*Mots-clés: Elevage-lapin; plan de sélection; plan hygiénique-sanitaire; monitoring; résultats.*

## INTRODUCTION

In Italy, the maximum producer of rabbit meat in the world ( Lebas and Colin, 1996) , the vertex of the production has been reached only after the introduction of the " weekly-cycled production".

This technique , adopted over 10 years ago , is based on grouping the breeding operations of the rabbits in one only established day of the week ( Facchin and Al., 1987).

This technique, associated to the technique of the A.I. afterwards proposed and utilized in the meat-rabbits breedings ( Facchin and Al.,1988 ) ( Valentini and Al. ,1988 ) (Zanirato and Al., 1988), has assumed to obtain a more hygienic and economical production , with benefits also at the level of work-organization, management and animal welfare ( Facchin ,1992).

The productive spinneret ( rabbit meat production chain ) requires more and more productions quantitatively elevated but also rigorously controlled by the hygienic-biosecurity point of view.

Consequently two programs of self-control for breeding have been proposed for all stock-raising that adhere to the Italian Rabbit Breeders Association (IRBA):

1)- a voluntary selective plan ( Scaia and Al. 1997), based on a program of genetic selection that was elaborated by the Center of Studies of the Italian Breeders Association (IBA ).

2)- a voluntary hygienic-sanitary plan ( Facchin , 1997), based on the guidelines embodied in the EEC Directive 117/92.

Both the programs have the following primary objectives :

- to select breeds and animals that will be more adapt for the production of high-quality meat.
- to control , by an hygienic and sanitary point of view , all the stock-raising that utilize the selective program.

Uterior objectives are also those that want to ensure the animal welfare and that want to diminish the risks of introducing infectioius diseases through the replacement of does that have been eliminated from the cycle.

The finality of this work is that to refer the preliminary results obtained in a selective stok-raising that belong to IRBA and that have adopted a genetic and hygienic-sanitary voluntary program.

The preliminary results will permit us to evaluate if the standard that has been reached is to be considered satisfying and if the voluntary programs that have been proposed are adequate.

## MATERIALS AND METHODS

The study has been made in a breeding in the province of Verona that is associated to the IRBA.The breeding has 450 mother-cages ( equivalent to 680 NZW rabbit does in cycle) and has been following the selective program of the IRBA during the last two years, togheter with the self-controlled hygienic-sanitary program.

With regard to this last one , the guidelines established that four monitorings/year were to be accomplished according to the scheme shown in table n° 1. besides an ulterior annual control performed in a sample of rabbit does with a positive selective index, between their 3rd and 10th parturition.

Ours research refers to a sample of 147 multiparous does and 9 males NZW that will represent an exemple of the genetic and the hygienic-sanitary level that has been reached in the breeding.

The breeding utilizes only A.I. with a reproductive cycle of 42 days ( six weeks) : The does are inseminated every 21 days with a three-week rhythm and they belong to the following categories :

- 1)- nulliparous does : inseminated for the first time at 18th week of life,
- 2)- lactating-multiparous does : inseminated 11 days after delivery,
- 3)- " Returns does" : inseminated 21 days after the previous negative service .

With regard to the A.I. technique , that is accomplished with sperm taken from single males that have a proven fertility, only those ejaculates that have a minimum concentration of 300 millions sperms/ml. with a motility of a least 75% have been utilized.

The does inseminated eleven days after parturiton have been treated , 72 hours before A.I., with 20 U.I. of PMSG or with 200 micrograms of Alfaprostol.; other categories of does will not receive any preparatory hormonal treatment.

The insemination will be made after having diluted 1:10 the sperm in a modified Tris Buffer diluent, with a glass pipette deep inside the vagina for at least 15 cm.

Right after the A.I., the ovulation is induced with an intramuscular injection of 0,8 micrograms/ head of Buserelin ( a synthetic analogous of GnRH).

The procedure that has been utilized incorporates all the reproductive and productive data relative to the breeding and to the animals with a program of technical management . Besides this, the program was also to accomplish all the monitorings that were scheduled ( see Tab. N° 1) and the gathering of the data relative to the results obtained.

The bacteriological monitoring was made with the same modalities that were described previously ( Facchin and Al. 1996), utilizing the laboratoty methods practiced in our Institute.

In this preliminary phase a statistical analysis of the data gathered was not scheduled. This type of analysis will be carried out in the future, comparing the " historical " data with the new data that will be the consequence of the continuation of these programs.

## RESULTS AND DISCUSSION

In Table N° 2 there is a summary of the reproductive and productive results that have been reached in the breeding during the year 1995. These results are to be considered as the baseline from which other eventual progresses will be estimated in the group chosen as the representative sample of selected animals

In Tab. N° 3 there is a summary of all the productive and sanitary data collected in the " sample" group of 147 does and 9 males, besides the relative progeny that is in the selective program.

In Tab. N° 4 there is a summary of those microbiological monitorings that were made to identify the possible presence of zoonotic agents and pharmacological residues in addition to the relative results that were acquired.

The establishment of these two voluntary programs had the objective to verify if there were the minimal preliminary conditions to be able to continue the improvement of the genetic selection and the hygienic-sanitary conditions. The final objective will always be to make the producer more and more responsible in giving assurances and certification regarding to :

- 1)- genetic value and hygienic-sanitary conditions of the breeders and the seminal material,
- 2)- the best welfare and health conditions of the animals,
- 3) the absence of zoonotic agents that can be transmitted to human beings and the absence of pharmacological residues.

The preliminary results that were obtained in this study, after two years of genetic selection , indicate that the initial breeding level was surely improved in some parameters ; for exemple : fertility, prolificacy and average daily weight increase.

This selection, that was established to ameliorate the most transmissible male characteristics, such the weight expressed as live weight,at the minimum age of 60 days of life of the progeny, has registered the predictable standard in over 70% of controlled breeders. Interesting performances were obtained in the average daily growth from 1 to 78 days of life of the rabbits ( 32,4 g.) This value is very close to the average of the results obtained in other Counties that have a greater experience and tradition in the selection and genetic evaluation ( Koehl, 1998).

Concerning the maternal characteristics, that are less transmissible, it is predictable that a longer and more continuative assignemt will have to be completed to reach the average results that have been already accomplished in other Countries ( Koehl , 1997).

Moreover, the high percentage of " genetic elimination" that has been encountered in the lactation period ( 1- to 18 days post-partum ) reiforces the requirement for the improvement of the selection pertaining to the " maternal" characteristic .

With concern to the hygienic-sanitary level , the preliminary results register a comprehensive adequate sanitary condition of the animals and an improved survival percentage of the selected progeny.

The results of the microbiological monitorings also reveal that the producer appears more responsible with reference to drugs utilization and toward the presence of residues in feeding and drinking water.

Concerning to the zoonotic agents that were monitored we must, once again, stress the difficulty to control the Dermatomycosis, wich is a problem widespead in the Italian rabbit breedings ( Facchin and Al. 1996) . In absence of specific medicaments that can be utilized as a therapeutic , the hygienic measures that must be adopted will have to be susequently implemented with other procedures. Possibly, even by mean of programmed sanitary vacuities, together with cleaning, washing and disinfecting programs, in function of those indications furnished by environmental monitoring that was brought forth.

## CONCLUSIONS

The accomplished selection that has been brought out during the last two years in a rabbit farm belonging to the IRBA had completed the improvement of some characteristics of the animals , such as fertility, prolificay, daily wieght increase,and survival rate up to commercial age .

This method will be even more trustworthy when there will be the possibility to compare the results obtained in successive years in homogeneous groups of selected animals.

It has been foreseen that this type of improvement will be able to be eventually increased up to the whole 100% of the breeders that, in the future, will present all the programmed performances. The method to select those animals that have a positive index and to control them once a year will furnish encouraging and continous results, similar in every aspect to those obtained in other animal species.

The hygienic-sanitary conditions that were encountered in the breeding permit us to establish that the level of "biosecurity" can be considered satisfactory. Only the Dermatormycosis (anthropozoonosis very widespread in the personnel employed inside the breedings) still results difficult to eradicate. Ulterior hygienic measures are necessary to be able to control this disease.

The accomplishment of "programmed sanitary vacuities", possibly associated with internal replacement program, by mean of A.I. and frozen semen, may be able to give a supplementary contribution. Besides this it may contribute positively in the improvement of the hygienic standard that have been reached in the farms. This type of practice will permit us to reduce also all those sanitary risks that are correlated with the introduction of adult animals

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## TABLES AND ILLUSTRATIONS

Table 1. Monitoring: working phases, risks, monitoring scheduled and limits of tolerance

Phase	Risk	Type of Monitoring	Tests	Data	Time	Limits
Pre-Agreement	Non respect scheduled requisites	Control by Vet. Service	Inspection	See plan	Only once	See plan
At the first housing and reproductive phase	Non complete sanitization premises equipment	Control by Vet. Service + microb. test	Swabs for environmental + ambiental air monitoring	Salm.spp L. monocyt Campylobac. Yersinia spp. Dermatomyc	Only once	No Salm.spp and L. monoc.
Breeding phase	No respect of welfare	Inspection	Control of breeding forms	See cards (fac-simile)	Each lot	Non stated limits
	No respect of management	Inspection	Control of breeding forms	See cards (fac-simile)	Each lot	Non stated limits
	No respect of hygiene and health	Microb.	Swabs for environmental + ambiental air monitoring	Salm.spp L.monocyt Campylobac. Yersinia spp. Dermatomyc	Every 3 months	No Salm.spp and L. monoc.
Finishing phase	Presence of residues in water and feed	Microb.	Water and feed in finishing deptm.	Residues search Salmonella search	Every 3 months	No residues No Salmonella
	No respect of welfare	Inspection	Control of breeding forms	See card plan	Each lot	Non stated limits

Table 2. The average reproductive-productive results obtained in the breeding associated with the IRBA throughout the year 1995

N° average of breeding animals present	685
Ratio between N° of mother-cages and N° of does present	1: 1,52
% of the annual replacement	107%
% of dead females	29%
Fertility ( % of deliveries / 100 I.A. )	68,5%
Average N° of born-alive/ delivery	7,9
% total mortality during lactating period ( 1-31 days )	14,5%
% total mortality after weaning	9,1%
Total N° of rabbit sold/ year / mother-cage	62
Average age of slaughtering ( days )	78
Average individual live weight at 78 days of life(Kg.)	2,430
Average Daily Weight Increase from 1 to 78 days ( g.)	31,1

Table 3. Reproductive-productive and sanitary data relative to the group with 147 multiparous does and 9 males previously selected in a trial of a IRBA associated breeding.

N° of deliveries	105	
Fertility ( % of deliveries / 100 A.I.)	71,5%	
Average N° of born alive / delivery	9,0	
N° of selected litters at 1 day of life	99	(= 94,2%)
Total N° of animal in selection at 1 day of life	792	(= 8/litter)
N° of litters selected at 18 days of life	77	(= 73,3%)
N° of animals selected at 18 days of life	579	(= 7,5/litter)
Average individual weight at 18 days of life ( g.)	337	
N° of litter selected at 60 days of life	75	(= 71,4%)
N° of animals selected at 60 days of life	527	(=7,02/litter )
Average individual weight at 60 days of life (g.)	1.922	
N° of animals selected at 78 days of life	525	(= 7,0/litter )
% total mortality between 1 - 78 days of life	12,5%	
N° of selectad animals at 78 days of life / A.I.	3,6	
Average individual weight in selected animals at 78 <sup>e</sup> days of life (g.)	2.525	
Average Daily Weight Increase from 1 to 78 days of life (g.)	32,4	
% of exclusion for genetic reasons in animals of 1-18 days of life	23,3%	
% of exclusion for genetic reasons in animals of 19-78 days of life	5,0%	

Table 4. Results of the microbiological monitoringsperformed in the IRBA associated breeding

Type of sample	Type of monitoring and N° of positive results					
	Salm.	L. monocyt.	Campyl.	Yersinia	Dermatom.	Residues Search
Ambiental swabs	0/8	0/8	0/8	0/8	n.e.	n.e
Air monitoring	n.e.	n.e.	n.e.	n.e.	3/8(*)	n.e.
Drinking water	0/8	n.e.	n.e.	n.e	n.e.	0/8
Feeding	0/8	n.e.	n.e.	n.e.	n.e.	0/8

(\*) The last three monitorings always gave positive results provoking the decision to establish a radical environmental disinfection in concomitance with a " programmed sanitary vacuity