A.I. IN RABBIT BREEDING:
NOTE 3: PRACTICAL PROBLEMS IN STANDARDIZATION OF A NEW METHOD
    FOR ARTIFICIAL INSEMINATION IN MEAT RABBIT BREEDING.

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INTRODUCTION

In 1986 an A.I. Service for meat rabbit breeding started. The results obtained in the first two year of activity /Facchin et al. 1988/ show that:
1 - the use of GnRh synthetic hormon is completely satisfactory;
2 - the selection of bucks and the control of their ejaculates help in improving the results;
3 - the use of diluted and refrigerated semen, stored for a maximum of 24-36 hours, gives positive results;
4 - the results vary both within and between herds.

The different results obtained in different breeding can be explained through the factor "breeding" /Facchin et al. 1988/ and it is influenced by different variables such as feeding, management and genetics of the does.
    Much more difficult to explain is the variability found in repeated services in one breeding.
    Some Authors /Roustan 1982/, /Rodriguez et al. 1983/, /Paufler 1985/, /Roca and Fanlo 1983/, /Sinkovics 1987/ refer that the A.I. results in practice are influenced mainly by female factors, besides the male factors and the semen treatment.
    In particular they refer that, during the lactation, the does are less receptive and consequently they have a lower pregnancy percentage.
    The inoculation of hormone to induce ovulation causes pseudo-pregnancy in the case of negative insemination. This phenomenon decreases the fertility rate if the following insemination is repeated within few days, that is during the same pseudo-pregnancy.

To standardize an operating method for A.I., Veterinarians and breeders have to keep in mind the following things:
- to choose which does to inseminate;
- to choose which interval to keep from the previous delivery or from the previous negative insemination.

Consequently, during routine A.I. service and in Summer, the worst period for mating, because of climatic conditions, it was performed a test recording the physiological status of the does submitted to A.I., considering this status as the interval from delivery or previous negative insemination.

MATERIALS ANS METHODS

From June 1987 to the end of October 1987 the interval from previous natural or artificial insemination and delivery was recorded (Tab.1: Fac-simile card).

Table 1.:Fac-simile card.

A.I. SERVICE

BREEDING....................ADDRESS.......................

D.V.M............DATE OF SERVICE.........REPETITION No...

HORMONE GnRh. .YES...NO...OTHER....YES...NO...WHICH?......

TREATMENTS BY THE BREEDER..YES..NO...WHICH?..............

ANIMALS.....................FEEDING.....................

NOTES...

Progr N°	DOE N°	BUCK N° & breed	days from deliv.	days from neg.AI	Pregn. + / -	deliv. date	N° born aliv/dead	Weaned N°/weight
1								
2								
3								

to be continued

The A.I. method always consisted in using a glass sterile pipette for each doe. This was done to perform a bacteriological control of eventual exudate or purulent material in genital tract. Does with sanitary problems were excluded from A.I.

The observations were carried out on 2,178 does belonging to 15 different breeding with 42 interventions.

Concerning the physiological status, the does were divided in two classes: nulliparous and pluriparous subjects. The latter ones were further classified in four groups: 8-14 days, 15-21 days, 22-28 days, more than 28 days.

The does which had a previous negative insemination have been divided in two groups: up to 18 days and more than 18 days from the artificial insemination intervention.

Does with an interval from delivery of 0-7 days were not considered because no one breeder presented animals with this physiological status for A.I.

The data were analyzed according to a linear model:

$$Y_{ijk} = \mu + \alpha_i + \beta_j + \varepsilon_{ijk}$$

where Y = observed datum, α = herd, β = physiological status.

RESULTS AND DISCUSSION

The results are summarized in Table 2. The results of does in different physiological status are reported in Tables 3 to 9.

As it can be seen from Table 2 the mean pregnancy percentage obtained from June 1987 to the end of October 1987 was 57.6% . This result can be considered satisfactory, keeping in mind the seasonal situation and the fact that the semen was refrigerated and stored for a maximum of 36 hours too.

The differences found in does at different physiological status are wide and sometimes statistically significant (P<0.01).

The obtained results confirm the findings of other Authors which refer how variable is the fertility rate with the physiological status /Roustan 1982/, /Rodriguez et al. 1983/, /Sinkovics 1987/.

The best results are reached with nulliparous does or multiparous ones not in lactation or with an interval of more than 18 days from the previous negative insemination.

Pooling together the results of the present research and those of other Authors, /Hulot 1973/, /Roca 1984/, /Sinkovics 1987/, which studied the influence of the delay from delivery to insemination on fertility rate, even if the considered intervals not ever are the same, it seems that during the first period after delivery, i.e. during lactation, the pregnancy percentage is highly variable and in any case low. In fact the coefficient of variability found by us are about the double compared to that belonging to the "more than 28 days" group.

This results should exclude, as regarding the A.I., the intensive rhythm of reproduction, although the results by Paufler 1985, with post-partum A.I. show a good fertility rate.

The higher coefficients of variability are found in the periods "8-14 days" and "15-21 days" (with a minimum of 17.6%

to a maximum of 80% of fertility rate in different breeding, Tab.3).

Clearly, besides the physiological status of the inseminated does, some other factors are responsible of that behavior.

It is then necessary a further deepening of the knowledge of feeding, environmental conditions and management that can determine this variability.

That's why the Veterinary Assistance has to go together with A.I. service.

It can be concluded that A.I. with refrigerated semen is a good technique for the nulliparous does and the multiparous ones with an interval of more than 28 days from delivery and does with more than 18 days from a previous negative insemination.

Concerning the results in inseminated does at 10th or 11th day post-partum, i.e. the most common technique in Italy, it seems convenient to check the efficiency of some hormonal treatments according to some references:
1 - increase the GnRh dose; /Rodriguez et al. 1983/
2 - treatment with PMSG /Torres et al. 1983/ or HCG
       /Molina et al. 1987/.

It is our opinion that, besides other environmental conditions and management, the feeding, above all, can influence the ovulation rate in inseminated does at 10th or 11th day after delivery. This can be argued considering too the work by Garcia et al 1984 on the ratio between live weight of the animal and its ovulation rate.

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TAB. N° 2 - Summary of the test. The fertility rate are
ANOVA means. Means bearing different
letters are different for P < 0.01.

INTERVAL FROM DELIVERY	N° ♀♀ A.I.	N° ♀♀ Pos.	% ♀♀ Pos.	V.C.
8-14 days	627	343	54.7% A	37.6
15-21 days	233	109	46.7% A	38.0
22-28 days	87	33	37.9% A	29.3
MORE THAN 28 days	189	130	68.7% B	18.6
NULLIPAROUS DOES	245	169	68.9% B	31.8
INTERVAL NEGATIVE INSEMINATION				
UP TO 18 days	218	110	50.4%	23.1
MORE THAN 18 days	579	361	66.9%	17.0
TOT.	2.178	1.255	57.6%	

TAB. N°3 - Interval from delivery 8-14 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ Pos. ++
1	22	9	40.9 %
2	96	57	59.3 %
3	44	33	75.9 %
4	37	20	54.0 %
5	36	19	52.7 %
6	34	6	17.6 %
7	75	43	57.0%
8	44	34	77.2 %
9	15	12	80.0 %
10	6	2	33.0 %
11	=	=	=
12	88	66	75.0 %
13	=	=	=
14	13	5	38.0 %
15	117	37	31.6 %
TOT.	627	343	54.7 %

TAB. N°4 - Interval from delivery 15-21 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ Pos. ++
1	100	37	37.0 %
2	=	=	=
3	=	=	=
4	=	=	=
5	5	4	80.0 %
6	12	·6	50.0 %
7	37	25	67.5 %
8	=	=	=
9	=	=	=
10	19	4	21.0 %
11	=	=	=
12	=	=	=
13	13	5	38.0 %
14	11	5	45.0 %
15	36	23	63.0 %
TOT.	233	109	46.7 %

TAB. N°5 - Interval from delivery 22-28 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ Pos. ++
1	37	8	21.6 %
2	=	=	=
3	=	=	=
4	=	=	=
5	12	6	50.0 %
6	=	=	=
7	14	7	50.0 %
8	13	7	53.8 %
9	=	=	=
10	11	5	45.4 %
11	=	=	=
12	=	=	=
13	=	=	=
14	=	=	=
15	=	=	=
TOT.	87	33	37.9 %

TAB. N°6 - Interval from delivery more than 28 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ Pos. ++
1	=	=	=
2	5	5	100 %
3	=	=	=
4	=	=	=
5	=	=	=
6	=	=	=
7	10	6	60.0 %
8	13	9	69.2 %
9	41	23	56.0 %
10	34	24	70.0 %
11	19	14	73.6 %
12	=	=	=
13	56	40	71.4 %
14	=	=	=
15	11	9	81.0 %
TOT.	189	130	68.7 %

TAB. N°7 - Interval negative
insemination
up to 18 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ ++ Pos.
1	9	7	77.7 %
2	19	11	57.8 %
3	=	=	=
4	34	21	61.7 %
5	16	10	62.6 %
6	67	26	38.8 %
7	4	3	75.0 %
8	8	=	=
9	=	=	=
10	=	=	=
11	6	3	50.0 %
12	=	=	=
13	=	=	=
14	63	29	46.0 %
15	=	=	=
TOT.	218	110	50.4 %

TAB. N°8 - Interval negative
insemination
more than 18 days

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ ++ Pos. +
1	12	8	66.6 %
2	44	36	81.8 %
3	45	29	64.0 %
4	10	8	80.0 %
5	105	75	71.4 %
6	76	47	61.8 %
7	8	8	100.0 %
8	25	16	64.0 %
9	=	=	=
10	=	=	=
11	8	7	87.5 %
12	16	11	68.7 %
13	=	=	=
14	=	=	=
15	190	116	61.0 %
TOT.	539	361	66.9 %

TAB. N°9 - Nulliparous does

BREEDING	N° ♀♀ ++ A.I.	N° ♀♀ ++ Pos.	% ♀♀ ++ Pos.
1	35	24	68.5 %
2	14	14	100.0 %
3	36	34	94.4 %
4	=	=	=
5	29	14	48.2 %
6	=	=	=
7	11	5	45.4 %
8	23	14	60.8 %
9	=	=	=
10	9	3	33.3 %
11	30	23	76.6 %
12	=	=	=
13	=	=	=
14	9	7	77.0 %
15	49	31	63.0 %
TOT.	245	169	68.9 %

SUMMARY

In order to obtain satisfactory results by A.I. it is important to adequately choose the animals by considering their physiological status, as to say the interval from delivery or from a negative preceding A.I. Among 15 herds which utilize A.I. technique more than 2000 does were observed. They were classified as nulliparous, multiparous with an interval from delivery of 8-14 dd, 15-21 dd, 22-28 dd and more than 28 days. Two further groups were made up of the does with an interval from the preceding negative insemination of less or more than 18 days. The research was performed with the aim to find an objective and standard technique to choose the most suitable subjects for the A.I. Data were analyzed by a linear model taking into account, as variability sources, the groups of does and the herds. The best results were obtained with the nulliparous does, with the multiparous ones being not in lactation and with those with more than 18 days from a preceding negative insemination.

RIASSUNTO

L'ottenimento di risultati riproduttivi soddisfacenti a mezzo della I.A. è collegato alla scelta degli animali in base al loro stato fisiologico inteso come intervallo dal parto o dalla precedente inseminazione artificiale negativa. In 15 allevamenti che utilizzano la tecnica di I.A. sono state osservate oltre 2000 coniglie riproduttrici suddivise nei seguenti gruppi: nullipare, multipare con un intervallo dal parto di 8-14 gg, 15-21 gg, 22-28 gg e più di 28 giorni. Due ulteriori gruppi erano costituiti dalle fattrici che provenivano da fecondazioni artificiali negative con intervallo inferiore o superiore a 18 giorni. La ricerca è stata condotta al fine di individuare una metodica obiettiva e standardizzata per la scelta degli animali più idonei per la I.A.. I migliori risultati sono stati ottenuti con le fattrici nullipare, con le multipare non in lattazione e con quelle a non meno di 18 giorni da una precedente inseminazione negativa.

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