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ARTIFICIAL INSEMINATION IN RABBIT

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History and up to date in references

A.I. technique in rabbits has been known and practiced for 60 years.
A precise description of the technique has already been written by Bonadonna who practiced A.I. in rabbits from 1930, using an artificial vagina (russian-italian model) manufactured and used for a long time in Italy (16).
Bonadonna underlined in his description:
- the interest of the technique in programmes of selection and cross-breeding;
- the existence of the difficulty in inducing ovulation in doe, animals with no sexual cycle
Drugs based on hormones nowadays available on the market are very good and valid in inducing ovulation in the rabbit ; so the absence of a sexual cycle and natural - continue ovulation are positive factors improving reproductive planning and production.

On the proceedings of the W.R.S.A. Congresses held every 4 years since 1976, it is possible to find works on both reproductive physiology and A.I.
The papers which were presented in previous congresses are reported in the references only as an up date.

At the Budapest congress (1988), Reproduction and A.I. were the subject of many papers, among which, one dealt with large scale A.I. of Angora rabbits (65), and three A.I. of meat rabbits (33) (80) (81).
Our studies on A.I. in meat rabbit breeding reveal the possibility of obtaining interesting results through a method based on 2 points:
1- Use of a weekly-cycled production, previously described (32)
2- Veterinary control both during (a) collection-evaluation of semen and (b) technical assistence at insemination.

During and since the congress in Budapest, the interest in A.I. has increased greatly, above all in those European Countries (Italy, France, Spain) where rabbit breeding is important.

Many widely read scientific and technical publications testify to all this.
For an up date, all the papers found in the referee regarding A.I.,which have been presented since the Budapest congress, are listed.

At present, in Italy, rabbit A.I. is a widely diffused technique practiced in various ways, using both semen produced in every single breeding and produced in A.I. Centres.

Almost all the inseminations are done with fresh or refrigerated material, stored for a maximum of 48 hours.

The use of frozen semen, that could give the final imput at A.I. diffusion, is still limited to research and experimental purposes. There is still lack of knowledge and application in the following topics:
- formulation and preparation of a specific cryoprotective diluent (valid and non toxic)
- identification of a standard and objective method for semen-evalaution.
- standardization of a freezing and thawing programme.

The results to date obtained using fresh and stored semen are to be considered satisfactory and encouraging ; in many cases performances are similar to or better than those obtained with natural mating (3) (12) (22) (34)
There are still poor and unsatisfactory results, due to a great variability of breeding-conditions (33) and of technique-application (7) (14) (78).

Leaving the problem of freezing semen to the 1996 congress, the aim of this Round Table could be:
- to analyse and discuss problems and factors influencing A.I. results, using fresh-refrigerated semen;
- to suggest an operative practice as "basic standard method"

A sequence of schematic " Cards" can help discussion and the development of the Round Table.

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CARD N° 1

AIMS AND ADVANTAGES OF A.I.

Management:
- better organization of work
- better planning of production, transport and slaughtering
- possibility of over-production during autumn and winter, when the market is more profitable
- easier carrying out of" sanitary empty".

Hygiene and Health:
- avoid physical contact of the animals during mating.
- replacement can be done introducing semen instead of live animals.
- A.I. makes easier cycled production based on periodic sanitary empty
- A.I. makes easier an all/in -all/out programme during the fattening period.
- may be vector of qualified technical assistence.

Economy:
- decreases time and cost of work
- decreases the non-productive interval in case of sanitary empty.
- decreases the number of males and their costs.
- increases the N° of productive does
- increases the sales and the gross-proceeds/working-unit

Selection and Genetics:
- A.I. facilitates selection
- helps the testing of bucks
- aids the use of B.L.U.P. method and crossing between lines-breeds
- spreads interesting genetic characteristics into future breeding (Frozen semen)

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CARD N° 2A

FACTORS INFLUENCING A.I. RESULTS

A)- Factors bound to FEMALE

1)- Possibility to pharmacologically induce ovulation (the most diffused hormone = GnRH)

2)- Female's ovulation rate bound to other factors, i.e. :

a)- state of oestrus or not

b)- physiological state (nulliparous or not- - lactating or not)

c)- interval since previous delivery

d)- interval since previous negative service

e)- health condition of the doe

f)- live weight and good form weight of the doe (live weight is also a health indicator)

g)- season ; room temperature and microclimate

h)- light and light programme in the reproduction department

i)- feeding and feeding programmes

l)- preparation of the doe for A.I. and medicated and pharmacological (hormones) treatments.

m)- other factors not known or not considered

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CARD N° 2B

FACTORS INFLUENCING A.I. RESULTS

B)- Factors bound to the MALE

1)- Age of male at first semen collection

2)- Health conditions (sanitary culling and vaccine prophylaxis)

3)- Libido and quantitative production

4)- Rythm of semen collection (once or twice/weekly)

5)- Quality of ejaculate (*) : Density
Motility
Cell integrity

6)- Individual and breed variability in semen production

7)- Season, temperature, moulting as factors affecting semen production

8)- Environmental conditioning and specific light programme for male (**)

9)- pharmacological and hormonal treatments(**)

(*) The importance of objective and standardized evaluation of ejaculates is always higher

(**) It's important to go deeper into the problem with research and studies.

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CARD N° 2C

FACTORS INFLUENCING A.I. RESULTS

C)- Factors bound to technology and processing

1)- Males in separated and isolated room

2)- Cages with appropriate size and floor

3)- Presence of washing-room and laboratory

4)- Use of washed, sterilized and pre-heated (30°C) equipment, preferably disposable material. Be careful with latex sheath of artificial vagina

5)- Calm, rational repetition and standardization in semen collection and dilution

6)- Systemic control of all the ejaculates with data-recording (se fac-simile of buck card)

7)- Dilution ratio according to the characteristics

8)- Use of suitable and controlled diluent

9)- Correct storage and transport of diluted semen

10)- Hygienic control of diluted-semen :
a) total bacterial count
b) bacteriological tests for pathogens
c) virological tests

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CARD N° 2D

FACTORS INFLUENCING A.I. RESULTS

D)- Technical and management factors

1)- Choice of breeding technique (Cycled or not)

2)- Choice of reproduction rythm (post-partum, - intensive, semintensive, etc.)

3)- Choice of light programme (constant or not)

4)- Choice of the does to be inseminated

5)- Preparation of the does for A.I.

6)- Method of insemination and data recording (see fac-simile card) (*)

7)- Induction of ovulation (type and dose of hormone)

8)- Housing of the does after insemination (no cage-changing after A.I. service).

9)- Technical assistence and veterinary control (*)

(*) Semen production and Artificial Insemination can be performed by the breeders, but, under strict veterinary control.

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CARD N° 3

PROPOSAL OF BASIC STANDARD METHOD

1)- Adoption of cycled production and A.I. in a fixed day of the week.

2)- Use of a changeable light programme (13 hours during spring time and 16 hours in autumn-winter)

3)- Reproductive cycle of 6 weeks (= 42 days)

4)- Rythm of reproductive exploitation = semintensive :
- Insemination at 10th-11th day post partum
- Reinsemination = 21 days after the previous negative service (= 31 days post-partum and 1-2 days after weaning)

5)- Does to be inseminated belonging to the following categories:
- nulliparous-does
- does at 10th day post partum
- does at 31st day post-partum

6)- Preparation for A.I. with:
- possible cage-changing 2-3 days before the A.I.
- hormonal oestrous-syncronization with PMSG or PGF2alfa 72-96 hours before A.I.
- possible administration of medicated feed for 3-5 days before A.I.
- fedd-additive with liquids, minerals, vitamins,etc.

7)- Insemination to be done with:
- Set for A.I. (see dia)
- use of one sterile pipette for each doe (the pipette can serve also as swab for bacteriological test in case of utero-vaginal infection)
- use of A.I. card for data recording (see fac-simile)

8)- Pregnancy test (=palpation) 2 weeks after service

9)- Sinchronization of deliveries with PGF2alfa inoculation at the 30th day of pregnancy.

FAC-SIMILE OF CARD FOR A.I. SERVICE

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

TECHNICIAN or VET.....DATE of SERVICE.....

HORMONE GnRH...YES....NO OTHER..YES...NO WHICH?.....

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

ANIMALS (Breed or Line).....FEEDING.....

NOTES.....

Progr. Number	Doe's° Number	Buck's Number	Days from part.	Days from negativ service	Pregn. + or −	Date of deliv.	N°born alive	N°Wean.
1.....								
2.....								
3.....								
4.....								

to be continued

FAC-SIMILE OF BUCK'S CARD (Front)

CENTRE OF SELECTION and A.I.....

BREED OF BUCK.....N° OF BUCK.....

FATHER'S N°.....MATHER'S N°..... ORIGIN.....

Date collec.	Libido	Quant. ml.	Colour	pH	Densit. of cell	Motil. of cell	Integr. of cell

to be continued

FAC-SIMILE OF BUCK CARD (Retro)

Date of A.I.	Place of A.I.	N° of insem does	N° of + does	N° of deliv	N° of born alive	N° of weaned	Weight at Wean.