Growth of the management in batch system in the west part of France: Results of the artificial insemination realized in 1999 with sperm from a specialized center

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GROWTH OF THE MANAGEMENT IN BATCH SYSTEM IN THE WEST PART OF FRANCE : RESULTS OF THE ARTIFICIAL INSEMINATION REALIZED IN 1997 WITH SPERM FROM A SPECIALIZED CENTER.

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SUMMARY: This work presents the 1997 practical results of a specialized Rabbit artificial insemination center (300 000 AI carried out from its creation in 1995). Fertility and prolificacy are at the same level than the ones obtained through natural mating. Variability within the farm is very high. The results are not affected significantly by the size of the farm, the type of Management or the month. These results confirm that today it is possible to produce semen in a specialized Rabbit artificial insemination center and to carry out distribution to commercial rabbit farms.

Key words: Rabbit, reproduction, artificial insemination, fertility, prolificacy

RESUME : *Ce travail présente les résultats pratiques obtenus en 1997 dans un centre d'insémination artificielle (SORELAP) diffusant du sperme de lapin à des élevages commerciaux et ayant réalisé plus de 300 000 inséminations artificielles depuis sa création en 1995.*
Les fertilités et les prolificités ont des valeurs identiques à celles obtenues habituellement en saillie naturelle. La variabilité d'une ferme à l'autre est très élevée. Les résultats ne sont significativement affectés ni par la taille de la ferme, ni par le type de management ni par le mois de l'année au cours duquel l'insémination artificielle est réalisée.
Ces résultats confirment donc qu'il est possible de produire en routine du sperme de lapin dans un centre spécialisé et de la distribué à des élevages commerciaux.

***Mots clés**: Lapin, reproduction, insémination artificielle, fertilité, prolificité.*

INTRODUCTION :

Rabbit artificial insemination has developed quickly in the last years in several European countries (Castallini 1996) in order to enable batch system management diffusion (Colin 1996; Muguerza Mayato, Goldaracena Arrizurieta and Leyùn Izco 1997). This technique is carried with to 2 different methods :

- the farmer collects and prepares the semen himself using males of his own farm,

or

- the semen is collected and prepared in specialized centers.

The first method is practically the only one used in Italy. On the contrary, in the last years, practically every French rabbit farmer buys semen from one of the 10 specialized centers (Lebas and Marionnet 1994). This type of Management is developing quickly in the North of Spain too (Muguerza Mayato, Goldaracena Arrizurieta and Leyùn Izco 1997).

The SORELAP center is located in Brittany in France and was created in 1995 with an agreement between 4 companies :

- a feed company, Purina France,
- a dairy artificial insemination center, URCEO
- two rabbit farmers coops : Lapin Angevin and Cuni Ouest.

The SORELAP center has a capacity of 448 males. It is divided in 7 rooms of 64 males each plus 2 quarantine rooms for the future breeders when arriving in the center (Le Boucher 1994). The center is equipped with a lab that dilutes and prepares the semen to be distributed. The SORELAP males belong to all the main French genetic types. As soon as the semen collected, it is diluted with an original diluent manufactured and patented by SORELAP using an original method of Professor SINKOVICS. (Sinkovics 1995). This processed semen can be conserved for 48 hours at a temperature of 0°. After dilution, the semen is put into "paillettes" (straws) and is sent by an express public mail company (chronopost) at a temperature of 0° in an isothermic box. Generally, it is shipped to the farmer within the day after the expedition. Consequently, the farmer still has 24 hours to carry out the inseminations in his own farm.

The farmers working with SORELAP use two different systems :

- the management system called "21 days system" consisting in inseminating half of the does every 3 weeks,

or

- the batch system method consisting in inseminating every doe each 6 weeks (Colin 1996; Muguerza Mayato, Goldaracena Arrizurieta and Leyùn Izco 1997).

The average results of the palpation and the number of born rabbits per litter are automatically registered for every serial of insemination.

We shall present, the results of 167 252 artificial insemination carried out in 107 farms initially. Then, these results will be analyzed in order to identify possible effects of :

- the farm
- the size of the farm
- the distance between the farm and the center
- the type of Management
- the genetic origin
- the month during which the Artificial Insemination is carried out

RESULTS AND COMMENTS

1. Results

Fertilities and prolificacies (Table 1) are very close to these ones obtained by Muguerza Mayato, Goldaracena Arrizurieta and Leyùn Izco (1997) for a center located in the North of Spain and working according to the batch system Management. They are at the same level of those reported by the technical - economical computerized program of the French ministry of agriculture, even for regions in which the rabbit farmers still use only natural mating (Ponsot 1996). Furthermore individual variability is lower than these ones reported by Castellini, Cacchin et Cancellotti (1990). Consequently, artificial insemination with semen processed in a specialized center can be currently used as a routine method.

PARAMETER	AVERAGE	STANDARD DEVIATION
Number of Artificial Insemination series	873	
Total number of Artificial Insemination	167 252	
Apparent fertility (palpation) (%)	78.64	8.88
True fertility (%)	72.48	9.82
Prolificacy	8.61	0.93
Number of bunnies / kindling	6.27	1.14
Different apparent fertility / true fertility	6.16	4.94

No differences have been observed for prolificacy, contrary at the results of Perrier et al (1998).

The true fertility values are 7.8 % lower as compared with the apparent fertilities calculated according to the palpation results. Such a difference is close to the one reported by Hurtaud (1993). The variability of this parameter is high (variation coefficient : 80 %). The average number of rabbits born per artificial insemination is about 6.2.

2. Variation between farms :

Average fertility and prolificacy results are very different from one farm to the other. For example, apparent fertility values vary between 66 % and 88 % (Figure 1), the true fertility values, between 53 % and 85 %, the number of rabbits born per litter between 7 and 10.

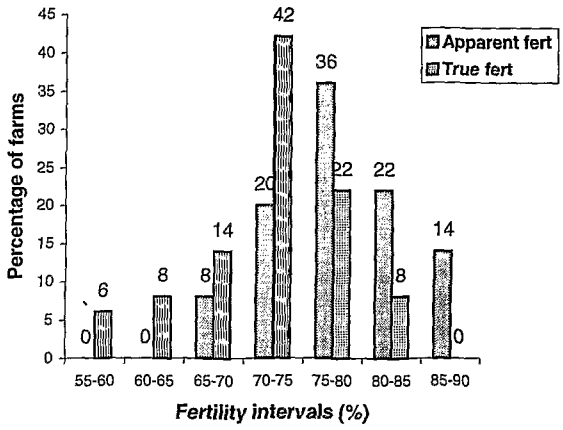

Figure 1: Distribution of the average artificial insemination fertility results per farm

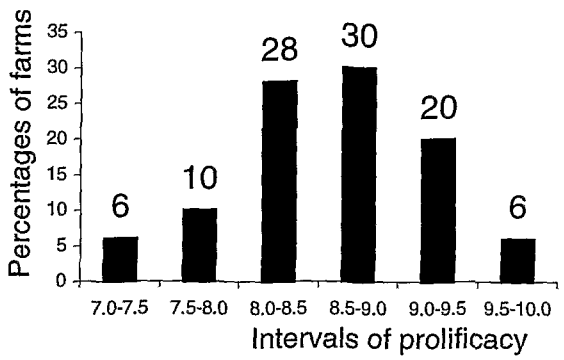

Figure 2: Distribution of the average artificial insemination prolificacy results per farm

Table 2 : Distribution of the farms related to the differences between apparent fertility and true fertility

Difference between apparent fertility / true fertility	Percentage of farms (%)
< 2.5	12
2.5 - 5	26
5 - 7.5	32
7.5 - 10	18
10 - 12.5	8
> 12.5	4

The differences between apparent fertility and true fertility vary between 0 and 15,5 % (Table 2). The main part of this difference may be due either to poor palpation experience of some farmers or to health problems provoking either embryonic reabsorbtion or abortion.

3. Size of the farms :

The smallest farms using SORELAP semen have 200 does and the biggest ones 1 100. Overall, the size of the farms has little influence on fertility and prolificacy results (Table 3)

Table 3 : Fertility and prolificacy results according to the farm size

Size (number of does cages)	Apparent fertility	True fertility	Prolificacy	Number of born per Artificial Insemination
< 300	79.7	70.0	8.6	6.0
300 - 400	78.1	77.6	8.6	6.9
400 - 500	83.3	68.1	8.9	5.9
500 - 600	75.4	74.2	8.7	6.4
> 600	76.2	70.2	8.5	6.1

4. Type of Management :

Table 4 : Results of fertility and prolificacy according to the type of management

Type of Management	3 weeks system	Batch system
Apparent fertility	78.55	78.92
Real fertility	71.77	73.66
Prolificacy	8.68	8.57
Number of born rabbit / AI	6.26	6.31

No difference can be observed for fertilities and prolificacies between the "batch system" farms (every doe inseminated every 6 weeks) and the "3 weeks system" ones (half of the does inseminated every 3 weeks)

5. Genetics status :

Table 5 : Fertility and prolificacy maximum and minimum values related to the genetic origin

	Minimum	Maximum
Apparent fertility	77.2	86.8
Real fertility	69.0	76.2
Prolificacy	8.2	9.1
Number of born / AI	6.17	6.65

The fertility and prolificacy values are very different from one genetic type to an other

6. Period of the year :

No significant differences can be observed between the fertilities and prolificacies of the artificial insemination carried out during the different months of the year (Figure 3). The expected fertility drop reported by Battaglini, Castellini and Lattaioli (1992) and Martinez Miro (1996) during the summer was not observed. These differences between these current results and the literature data can be explained either by some differences within the semen preparation method or by the Brittany climate characterized by a mild temperature even during the summer.

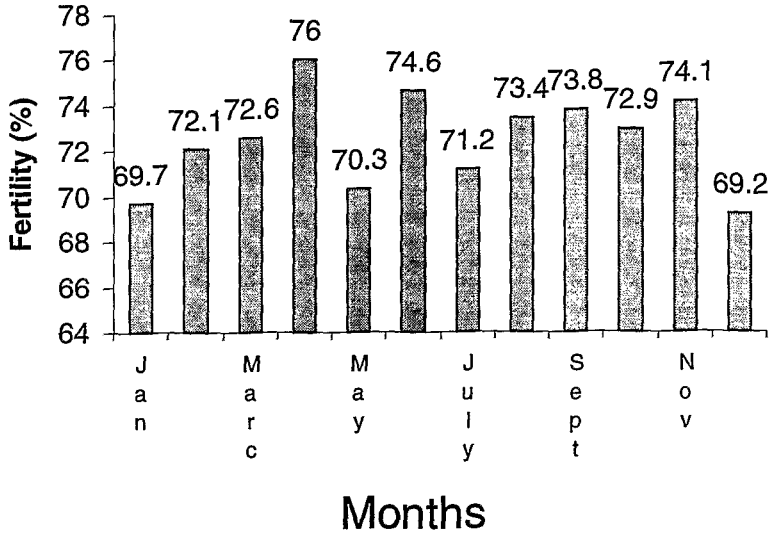

Figure 3 : Fertility results related to the month during with artificial insemination is carried out.

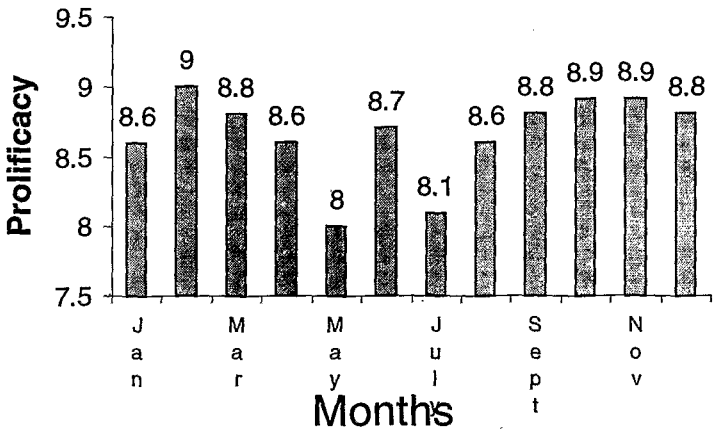

Figure 4 : Prolificacy results related to the month during with artificial insemination is carried out.

CONCLUSION :

These results confirm that rabbit artificial insemination can be currently developed with semen supplied by specialized centers. The utilization of a patented method of semen preparation and conservation allows to maintain fertility for at least 2 days : semen distribution from a center to the commercial farms is consequently possible from a practical point of view. Even with such a standardized method, a strong variability exists within the farms as with the natural mating.

Furthermore, fertilities and prolificacies are not affected by the number of does of the farms, by the type of management or by the month of the year during with artificial insemination is carried out.

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