Bar coding of semen straws

How does it work in France?

Why a bar coding system on straws?

- To improve the traceability from the production to the insemination
- To improve the reliability of the bull identification and thus of the testing procedure
- To improve the sanitary safety of AI through the possibility of tracing any defective ejaculate









In the barn and in the collection area





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Why a bar coding system on straws?

- To improve and facilitate the recording and monitoring of breeding data
- To facilitate the calculation of Non Return Rates per bulls, per ejaculates or per batches of semen
- To test different semen processing methods on split ejaculates (batches)
- To facilitate the printing of invoices and breeding documents
 To facilitate and secure the storage of straws

In the lab and storage room











In the fields







Technical challenges

barcode: 3cm/1mm
a straw is cylindric and must also display « conventional" information
both clear and dark zones are important and must be distinctly printed

-Reading must be: - quick
- reliable and repeatable
- must not interfere with
non return rates
- Must be as universal as possible

What kind of information?

The bull's identity: name? Number?National? International?

The ejaculate identification:date? Number?
Within the semen production center?
Universal through which data base?

What about split ejaculates?

Solutions

Code 128: easier, safer, universal and self controlled 10 digits: 12345 6789 0

Bull number date Batch intra ejaculate

Bull number: 99999 possibilities for 1100 bulls tested every year in France

Date: number of days spent since January the 1rst 2002; 9999 days = 27,3 years May, 18th, 2006= 1599

Batch number: 10 possibilities (from 0 to 9)

Solutions



Today's French situation

Printing:

- One supplier (IMV Technologies):Lynx
- 100% of the French production labs are equipped and print

Reading in the fields:

- 75% of the French AI technicians read and register the bar code prior to the AI
- Two different but compatible readers

Two different readers





Results and potential evolution

- -more than 85% of straws are read prior to AI (others produced « outside »)
- -more than 95% reliability and possibility to record manually
- -NRR calculated on routine
- -bar code allows to save time and to secure the data
- -Adding three more digits is technically possible (printing and reading)and would permit to code for the country of production. ICAR discussions still undergoing at an international level (NAAB code)

Conclusions

It took around 8 years to get an agreement of all semen production centers

► Today the system is simple, efficient and reliable

 It is transposable to other countries just by adding three more digits identifying the country of origine: (alpha numerical)
 Ex: FR 12345 6789 0

Conclusions

A European data base of all European bulls could be managed by Copa Cogeca through ICAR

Such a DB would

- facilitate exchanges of semen between countries thanks to a better traceability
- Allow the calculation of statistics and NRR according to the origine of semen
- Permit international cooperation and experiments

New legislation of the French genetic and artificial insemination improvement system Movements of Semen and traceability in the fields

Circulation of doses - Background -

Semen collection centers and storage centres :

- Are under supervision of the Ministry of Agriculture (agreement and n° of registration)
- Are under the responsability of a veterinary surgeon
- Must be visited twice a year by Vet Authorities
- Must keep a precise and up to date inventory of doses of semen coming in or going out

Circulation of doses - Background -

Semen depots :

- Can only be supplied by an officially agreed semence production center or by an officially agreed semen storage centre
- Have to be declared by the Selection Unit to the French Breeding Institute or by the breeder to the local breeding establishement
- Are directly set under the responsibility of the Selection unit or of the breeder

Circulation of doses

Becoming of straws within the semen deposite

Depot of semen at the breeder 's

- Utilization for AI
- Destruction
- possible exemptions by the vet autorities provided of a sanitary laisser passer (pass)
- Depot of semen of an inseminator working for an AI coop
 - Utilization for AI
 - Destruction
 - Depot of semen of another inseminator of the same AI coop
 - Depot of semen of a breeder

Movements of doses officially permitted



movements of doses



TI : technicien d'insémination=inseminator

Management of semen depots - obligations -

Depot of AI technicians (responsability of the Breeding Unit)

- Draw up of the inventory of doses coming in or inseminated
- Implementation of a storage plan
- Transmission of the performed AI to the National Data system SIG (accepted period = 2 weeks)
- Respect of traceability

Depot at breeder's for intra-herd inseminations (responsability of the breeder)

- Draw up of the inventory of doses in the tank
- Recording of the performed IA and transmission to the SIG (accepted = 1 month)
- Inventory and IA recorded in the breeding register of the farm.

Inventory of the semen deposite

- Compulsory Inventory of all movements of doses (in and out) –by hand or by computer
- Inventory content :
 - identification N° of the bull
 - Number of doses per bull
 - Date of entry and date of exit with the number of doses per batch
 - The location in the tank
 - The origin of the straws (agreed collection centre or storage centre, supplier) and the destination of the doses (AI or destruction)

Information printed on the Ai bulletin

- Data regarding the company
- Registration N° of the operator (BU) \rightarrow F
- Registration N° of the inseminator \rightarrow E
- Data regarding Ai and semen traceability National N° of the bull \rightarrow A
- Breed of the bull \rightarrow A
- identification N° of the **female** \rightarrow B
- Reference of the **dose** (date of collection) \rightarrow C
- Date of AI → D
- Registration N° of the farm delivered by EDE (8 digits) \rightarrow G

7-4 Exemple de bulletin d'IA



Autres exemples de BIA >

Information printed on the AI bulletin

Registration N° of the farm: N° with 8 digits delivered by the local breeding establishment

- 1 et 2 = N° of the département
- 3 4 et $5 = N^{\circ}$ INSEE of the district
- 6 7 et 8 = ranking N° of the farm within the district

Transmission of the AI bulletin (AIB)

- AI coop
- Transmission of the AIB to the SIG → time limit:2 weeks from the dateof AI
- ARSOE =CRI
 - Control
 - Transmission to CTIG after treatment of data
- ► CTIG
 - Indexes calculation
- Institut de l'Elevage
 - Publication of indexes





Thank you for your attention





