2nd Special session on AI
New technologies

Automatic systems to identify semen straws:why and how?

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Outlook

- Introduction
- Definitions
- Why?
- How?
  - Description of the current organisation :
    Semen production, semen flow, AI
  - Constraints
- Discussion and conclusions

Introduction

- Reading items on semen straws is not easy !!

Introduction

- Reading bull ID for safe recording is essential
- Then…
  - Automatic reading system should be a solution
  - Needs organisation and equipment
- This is not a new idea but implementation depends on
  - Technology advances
  - Adaptation of companies strategies

WHY?

- To avoid mistakes in reading/writing process
- To save time and administrative costs
- To record more information (collection code)

Outcomes expected by the industry:

- ***To improve semen traceability***
- ***To improve accurate recording of items printed on straws***
- ***To use batch semen information in semen processing and genetic evaluation of fertility***

Short description of the current organisation of semen production, semen flow, AI

Collecting centres

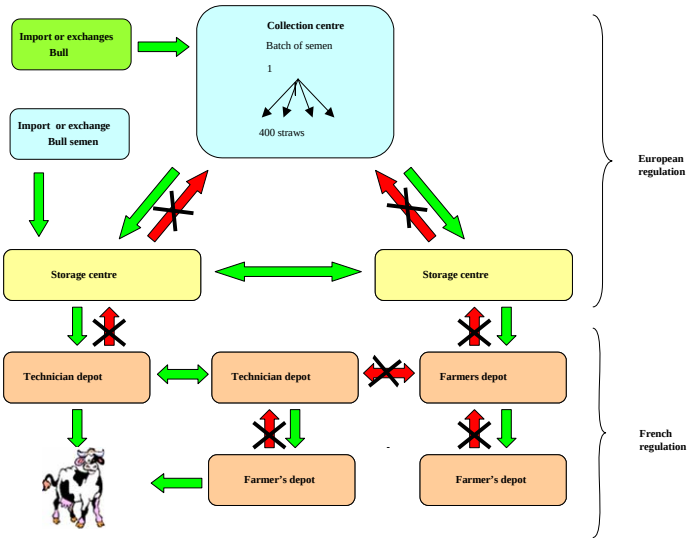
- Produce semen, storage before distribution
- Automatic system may render possible continuous recording of Id bull all over the process

  Bull / semen collecting /processing / straw filling / straw

  without using cross-reference files
- Frozen semen straws are moved from container to container within the centre (quarantine-long storage-straw distribution). Safe ID must be used.

Short description of the current organisation of semen production, semen flow, AI

Semen flow



Short description of the current organisation of semen production,semen flow, AI

AI technicians record technical data, among a set of information.

ICAR recommendation indicate data that should be recorded.

Various systems exist to record: paper, electronic device, so as access to data base.
Straw identification is also harmonised through ICAR recommendation:

- semen collection or processing centre code
- breed
- identification of the bull (ID or HB number, name)
- collection code: date where the semen batch was collected

Automatic identification of straws must refer to these items

AT Stake :automatic recording of collection codes

Collection code: identify batches of semen straws

BIOLOGY

- **Bulls are collected 1-3 time a week to produce ejaculates**
- **One ejaculate= 300 – 400 straws by batch**

PRODUCTION STRATEGY of AI COMPANIES

- **Production / bull / year = (0) 5 000 – 100 000 units**

AI (2006 French data)

- **4 millions 1rst AI = 6.8 m services (doses) 7310 AI bulls**
- **Estimation of batches used / year = 48 000**
- **Estimation *by one company* of N°of batches / bull / year = 5**
- ***Remark :25 – 30 millions units produced by year in France***

HOW: constraints (1)

Physical:

- Size on a 0.5 ml cylinder container
- Space available for non automatic-automatic reading systems
- Deep frozen material in N^2 (-196°C)

Practicability

- Allocation of codes for automatic reading
- Reading has to be quick, accurate
- Systems have to accept automatic and not automatic reading
- AI bulls files in technician data base must be matched with automatic reading systems of ID bulls/collection code on straws.

HOW: constraints (2)

Current available technology

- Today: bar codes (limited number of digits)
- Tomorrow?

Organisation

- Equipments: labs, AI technicians
- Fits well for AI companies providing AI services
- Coding of information for automatic reading
- Files management and exchange of data

HOW: constraints (3)

CODING of collection codes for AUTOMATIC READING

Definition of items to be coded:

- ***Limited number of digits: maximum number?***
- ***How to code?***
- ***What is to be coded?***
- ***Significant / Non significant code?***

	On straws	In data base
Significant	50293 / 12345 Id bull /date transf	Id bull 50293 Transf date:19/06/08
Non-Significant	1234567890	Cross reference file 1234567890= Id bull /date *FR 44 98 050 029 -190608*

HOW: constraints (4)

Debate on coding significant/non significant

System	Advantages	Disadvantages
Non significant code	oNo need to define code structure oCodes are practically unlimited and don't have to be changed over the time oCode may refer to a large number of items	oManagement of cross reference files. o Data base must be referenced with any batch of semen susceptible to be used. oAdapted to situations of strong integration production distribution.
Significant code	oNo need to store references of any batch of semen in the data base oFits well with AI industry practices: refers to bull's number & date of collection is easy to define oEasy to implement when there are many semen movements	oCode structure must be defined oCode list of bulls may be accessible to any stake holder of the AI industry. o Codes of bulls or dates are not unlimited. oWell adapted to countries having a strong national organisation of AI.

DISCUSSION CONCLUSION(1)

COSTS

- Specific printers for labs.
- Technicians: in addition of current equipment, 0.1%.
- Data processing / administration ?

BENEFITS: DIRECT

- Better management of semen processing (field trials to assess semen processing)
- Better efficiency of tools for AI recording
- Better image of AI company?

BENEFITS: INDIRECT

- Traceability: limitation of arising problems (disease outbreak, recording mistakes: wrong parentage)
- Better parentage recording
- Better (more accurate) genetic evaluation of fertility

DISCUSSION CONCLUSION(2)

EXHAUTIVITY of RECORDING

- Impossible
- Systems must accept traditional and automatic reading
- Farmers and free lance operators: not involved

INTERNATIONAL HARMONISATION

- Very important
- ICAR recommendation is in discussion

CONCLUSION

- ***Automatic reading of semen straw in no more a dream but a project: it will be implemented systematically in many countries***

Thank you for your attention…

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