Approval of official permanent eartags in France

Sébastien DUROY
Institut de l’Elevage (France)
The French Livestock Institute

Summary

1. Introduction

2. Test Protocol
   2.1 Preliminary Assessments
   2.2 Laboratory Tests
   2.3 Field Test

3. Possible improvements of approval procedure
Introduction

➢ Cattle
  - 1970′ – Start of tests
  - 1982 – First revision of field test protocol (generalization of official cattle identification)
  - 1999 – Second revision of field test protocol

➢ Sheep and goat
  - 1997 – Start of laboratory tests

Test Protocol

3 phases, step by step

1 – Preliminary Assessments
   If OK

2 – Laboratory Tests
   If OK

3 – Field Test
Test Protocol

3 phases, step by step

1 – Preliminary Assessments

If OK

2 – Laboratory Tests

If OK

3 – Field Test

Preliminary assessments

• Purpose: Evaluate the use of tag and pliers in application

• Test Organisation
  - In slaughterhouse
  - 100 ears of dead mature animals

<table>
<thead>
<tr>
<th>Test on ear of dead mature animals</th>
<th>France</th>
<th>ICAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of machine readability</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Locking system</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

(Temperature test: 23°C and 80°C manual at 80°C)
Test Protocol

3 phases, step by step

1 - Preliminary Assessments

If OK

2 - Laboratory Tests

If OK

3 - Field Test

Laboratory Tests

1. Characterization of material
   - Polymer
   - Plastifying agent
   - Composition
   - Shore

2. Performance Tests
   - Resistance to chemical agents
   - Resistance to abrasion treatment
   - Resistance of the locking system
Laboratory Tests

1. Characterization of material
   - Polymer
   - Plastifying agent
   - Composition
   - Shore

2. Performance Tests
   - Resistance to chemical agents
   - Resistance to abrasion treatment
   - Resistance of the locking system

Resistance of printing

- Resistance to chemical agents (ISO 2812)

1. Acid bath treatment
   - pH = 3
   - 50 °C
   - 3 weeks

2. Alkaline bath treatment
   - pH = 12
   - 50 °C
   - 3 weeks

France: Measure of contrast
ICAR: Visual assessment
Laboratory Tests

1. Material Characterisation Tests
   - Polymer
   - Plastifying agent
   - Composition
   - Shore

2. Performance Tests
   - Resistance to chemical agents
     - Resistance to abrasion treatment
     - Resistance of the locking system

Resistance of printing

- Abrasion (ISO 9352)

Abrasion machine

Measure of contrast after 0, 450 and 900 cycles

Photo: Source CETIM
Performance tests
Resistance to abrasion treatment

Initial state (0 cycles)  After 450 cycles

Performance tests
Resistance to abrasion treatment

After 900 cycles

APPROVED
Performance tests
Resistance to abrasion treatment

Initial state (0 cycles)  After 450 cycles

Laboratory Tests

1. Material Characterisation Tests
   - Polymer
   - Plastifying agent
   - Composition
   - Shore

2. Performance Tests
   - Resistance to chemical agents
   - Resistance to abrasion treatment
   - Resistance of the locking system
Performance tests

Resistance of the locking system

- Resistance of the locking system (ISO 527)

ICAR parallel pull test
FRANCE unparallel pull test

Mechanical testing machine

Panel tags only

Source photo: Instron

ICAR Subcommittee on Animal Identification, Niagara Falls, 17 June 2008

PANEL TAG
Performance tests

Resistance of the locking system

**FRANCE** (23°C, 50 tags)

Locking system is approved if:

- **Tensile force:** at least 49/50 tags break above the limit (280 N)
- **AND**
  - **Way of breakage (tamperproof characteristic):** at least 45/50 tags are non re-usable

Test is also performed:
- with 10 unused tags at –10 °C
- with 10 unused tags at 45 °C
- with 10 aged tags at 23 °C
Performance tests
Resistance of the locking system

ICAR (−23°C, 23°C, 45°C with 5 unused tags and 5 aged tags)

Locking system is approved if:

- **Unused tag:**
  The mean force applied should not cause breakage or unfastening at 280 Newton or less with a standard deviation of 20 Newton

- **Aged tags:**
  “The mean force applied should not cause breakage or unfastening at 250 Newton or less with a standard deviation of 20 Newton”
Performance tests
Resistance of the locking system

Non Re-usable tags …

Test Protocol

3 phases, step by step

1 – Preliminary assessments

If OK

2 – Laboratory Tests

If OK

3 – Field Test
Field Test

TEST ORGANISATION

- **France**
  - 24 months
  - 3 areas (dairy herds, suckler herds, mountains)
  - 60 farms, approximately 3000 births,
  - 500 cattle after 24 months

- **ICAR**
  - 12 months
  - 2 countries
  - 30 farms, approximately 750 calves,
  - 200 cattle after 12 months

TAG APPLICATION

- Animal tagged by the farmer within 20 days of birth
- In alternate ears on successive animal
Field Test

PROVISIONAL APPROVAL

- **France**
  
  After a test period of 6 months, if:
  - no problem with tag application in farm
  - Survival rate $\geq 0.95$
  
  − Possibility for manufacturer to sell tags
    up to 20% of official market

- **ICAR**
  
  After a test period of 3 months, if:
  - Retention rate $\geq 0.99$
  - Necrosis rate $\leq 0.03$

Field Test

FINAL APPROVAL

- **France**
  
  After a test period of 24 months, if:
  - Survival rate $\geq 0.95$

- **ICAR**
  
  After a test period of 12 months, if:
  - Retention rate $\geq 0.98$
  - Necrosis rate $\leq 0.03$
Field Test

RESULT ANALYSIS METHOD
- Analysis of survival data
- To describe the "lifetime" of an element over time
- Method comes from human epidemiology
- Survival rate result from calculation of probability that a tag is not "dead" over N months

"Dead tag" :
lost broken illegible

Possible improvements
... of approval procedure

1. Integrate the notion of “eartag family”
2. If statistically possible, decrease the number of farms to reduce the price of tests
3. Implement field tests for sheep and goat tags