

Towards two identification methods for breeding pigs: possibilities of a combined ear tag

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Abstract

The objective of this study is to develop a reliable, practical and affordable combined farm and slaughter identification for Dutch breeding pigs (sows and boars) before 1 January 2012. In consultation with representatives of pig farmers, breeding institutions, traders, slaughterhouses and governments a list of requirements for the combined ear tag has been set up. After initial interest for prototyping nine manufacturers have been visited and the requirements were discussed. Ultimately, six of the manufacturers produced a total of 13 prototypes for testing. Prototypes were subjected to a visual test and a test in two different slaughterhouses. Only four of the 13 prototypes met the established slaughterhouse criteria (loss rate < 5%). These four were then tested on three pig farms. The infections, irritations and inflammation depend on husbandry conditions and the type of ear tag. The on farm loss rate of ear tag prototypes was less than 2%. The readability of the combined ear tags on the farms is not problematic. Retagging after loss was possible for one person using the existing hole but resulted in slight discomfort for the animal. During transport of the animals there were no losses. In the following slaughterhouse test no physical losses occurred. However, the functional loss rate in the slaughterhouse was above 5%. Practical implementation of the combined ear tags was studied by interviews with several stakeholders. Focus in the interviews was on the regulations, the attachment of the combined ear tags, the process of transporting pigs to the slaughterhouse, including transport, assembly and export, the need to renumber pigs, the service of the slaughterhouses for blood sampling, and the I&R in relation to the needed documentation and forms during transport. From the interviews it becomes clear that implementation in practice needs numerous reattachments and renumbering of ear tags. This leads to slight discomfort to the animals and increased labour for the farmers. This retagging has negative influence on the reliability of the data and on the guarantees of food safety. The results lead to the overall conclusion that the introduction of a combined ear tag under the current conditions is not justified as a solution to go from three to two identification procedures for breeding pigs.

Key words: breeding pigs, RFID, ear tags.

1. Introduction

The Dutch pig sector is engaged in the task of reducing the number of interventions for identifying pigs (Regeling, 2003; RICHTLIJN 92/102/EEG, 1992) In previous steps the number of identification methods for breeding pigs is already limited from four to three. Now the step from three to two is faced. So, for the breeding pigs the following task is left: develop for breeding sows and boars before 1 January 2012 a reliable, practical and affordable combined farm and slaughter identification number that meets the requirements of the primary sector, breeding institutions, the slaughterhouses, transport organisations institutions and government. The choice for the development and testing of a combined ear tag comes from previous research (Hoofs et al, 2007; Schuiling et al, 2003) and the resulting expectation that in the present circumstances it is the most likely solution. This paper describes the development and test in short and it is based on a Dutch report (Lokhorst et al, 2011).

2. Requirement definition

In consultation with representatives of pig farmers, breeding institutions, traders, transporters, slaughterhouses and governments a list of requirements (see table 1) for the combined ear tag has been set up. It indicates whether a requirement is mandatory or optional. Furthermore, a distinction is made whether or not standardized between requirements arising from the legislation and the practical use. Mandatory requirements of the regulations are weight of the ear tag less than 10 g, material should be a thermoplastics, a metal, or something similar, its unique farm number (UBN) and identification and registration logo (I&R) must be readable (6.5 x 3.5 mm), and the ear tags should be present at the pigs when they will be transported for the slaughterhouse.

TABLE 1: Summary of requirements for the combined ear tag (x = mandatory, o = optional)

	Requirement	Option
Legislation normative	<ul style="list-style-type: none"> • ≤ 10 g • Thermoplastic, metal and/or • UBN (7: 6.5x3.5 mm) + logo • Attached in the ear when pigs leaves farm to slaughterhouse 	<ul style="list-style-type: none"> • X • X • X • X
Legislation non normative	<ul style="list-style-type: none"> • Minimal probability tearing out • No structural irritation • No sharp corners and borders • No rough ravelled wound 	<ul style="list-style-type: none"> • O • O • O • O
Practical normative	<ul style="list-style-type: none"> • UBN (7) + logo readable > 50cm • Serial number slaughter number (≥ 5) readable > 50 cm • Farm code (≥ 5, to be applied by farmer) > 2 m • Loss rate till slaughterhouse < 5% during slaughtering < 5% • Age pig for first tagging ≥ 7 months • (Parts) can be closed in one way • Pin is round and polished • Durable / consistent shape (UV), 4jr • Temperature stand for -10 – 40°C • Can be combined with electronic identification RFID (for electronic sow feeders) • Part with slaughter number must survive slaughter process • Tagging to the pig: 1 person, 2 min/pig • Price: ≤ €1.50 • Must fit environmental restrictions • Replacement when needed must be possible • Retagging in existing hole must be possible 	<ul style="list-style-type: none"> • O • O • X • X • X • X • O • X • X • X • X • X • O • O • O • X • X
Practical non normative	<ul style="list-style-type: none"> • Animal friendly (quick wound recovery) • Will not become dirty • Smooth surface • Can be cleaned easily • No allergic reaction • Serial numbering possibility 	<ul style="list-style-type: none"> • O • O • O • O • O • O

Mandatory requirements from practice are: having a company code (more than 5 characters and possibly self-adjustments), maximum loss rate of 5% till slaughter and 5% during slaughter process, can be attached from the age of 7 months or more, durable and stable for a period of 4 years, can stand temperatures from -10 to + 40° C, possible to be combined

with an electronic identification (RFID), resistant to the slaughtering process, replaced in the same hole as possible. The optional requirements include readability, easy application, price, ease for animal (formation and recovery of wounds) and working with succeeding numbers and ranges of numbers.

3. Prototype development and testing

3.1. Prototype development

For prototyping the combined ear tags all suppliers of pig ear tags (I&R and slaughter tags) according to the data of the Dutch ministry for Economic affairs, Agriculture and Innovations (EL&I) (March 2010) were approached. Nine of eleven manufacturers after initial interest have been visited and the requirements were discussed. Ultimately, six of the manufacturers produced a total of 13 prototypes for testing (see Table 2).

TABLE 2: Thirteen prototypes for combined ear tags



3.2 Visual and slaughterhouse test

In a first round the prototypes were subjected to a visual test and a test in two different slaughterhouses, with specific interest for the physical and functional losses. Only 4 of the 13 prototypes met the established slaughterhouse criteria. Results of physical and functional loss rates are shown in Figure 1. The average physical ear tag loss rate was below 5%. For two off them the manufacturers improved there prototype before the field test started. From this point in the project, these four types were identified from A till D, where A = type 11, B = type 01, C = type 13 and D= type 7.

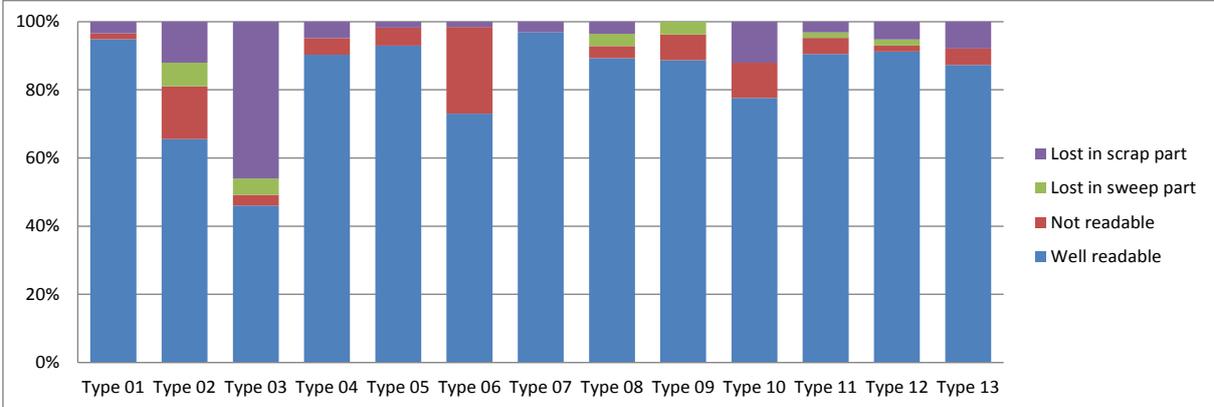


FIGURE 1: Results from the tests in one of the slaughterhouses

3.3 Practical testing

With these four prototypes experiments on three pig farms were started. Applicator convenience, functional and physical loss, inflammation and irritation, size of the holes in the ear, the loss of metal plates and the convenience of reattachments for human and pig were determined. The field test revealed that the wound healing and the occurrence of irritation (see Figure 2) is a concern. The expectation is that this concern applies not only to combined ear tags but also to I & R tags. The full recovery from the wound takes quite a lot of time and even after half a year, not all wounds were completely recovered. The number of infections and the degree of inflammation is dependent on the husbandry conditions and the type. Irritation occurred just after application and then recovered fairly well. But some time after application irritation occurred again. The degree of irritation depends on the type and operating conditions. The loss rate of combined ear tags during the trial was limited to just less than 2%. Ear tag type A which had metal plates for reading in the slaughter house more than 50% of these metal plates was lost. The size of the hole of the combined ear tag at 26 weeks after application was in most cases less than 1 cm and was in many cases even the same size as the diameter of the pin of the combined ear tag.

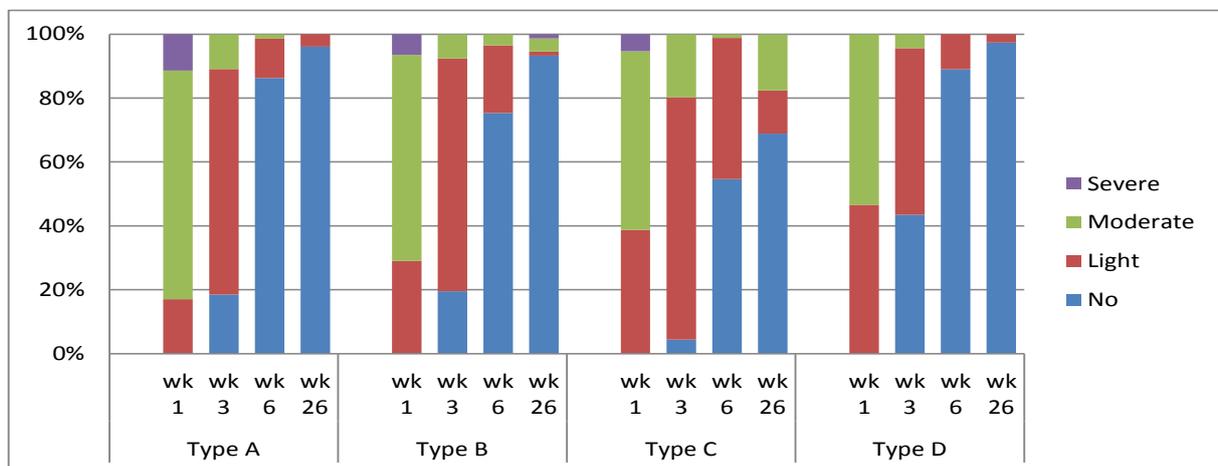


FIGURE 2: Irritations results after 1, 3, 6 and 26 weeks on three practical pig farms

The diameter of the hole, however, is significantly different for the different types and husbandry conditions. The readability of the combined ear tags on the farms is not problematic (this applies to all types of all companies). During this practical test also the reattachment of combined ear tags was observed. Removing the old ear tag and bringing in a new in the existing hole is tested. Results are shown in Table 3. Retagging after loss was possible for one person using the existing hole. The time required for this reattachment can vary widely and can increase considerably when an animal starts to run. It may also lead to slight discomfort for the pigs.

TABLE 3: Results of observations during reattachment of combined ear tags.

Type pig house	Number of pigs	Size (cm) ; no. of holes	Time/pig [s]	Wound	Animal welfare discomfort	Ease of application
Service house	3	<1: 2x 1-2: 1x	21	No	Light discomfort	Fairly easy to perform
Pregnancy house	4	<1: 1x 1-2: 3x	84	No	None to light discomfort	Fairly easy to perform
Farrowing house	4	<1: 1x 1-2: 3x	9	Light wound in one pig	None to light discomfort	Easy to perform

3.4 Transport and second slaughterhouse test

Based on experience in the pig farms three of the four prototypes were used for a transport pilot and a second trial in a slaughterhouse. During the transport of animals there was no physical and functional loss found of the combined ear tags. However, in the slaughterhouse physical and functional loss in all the three prototypes included in the test was more than 5%. It should be noted that the supplier of type D indicated that he was unable to deliver combined ear tags material with the proper fire-retardant properties.

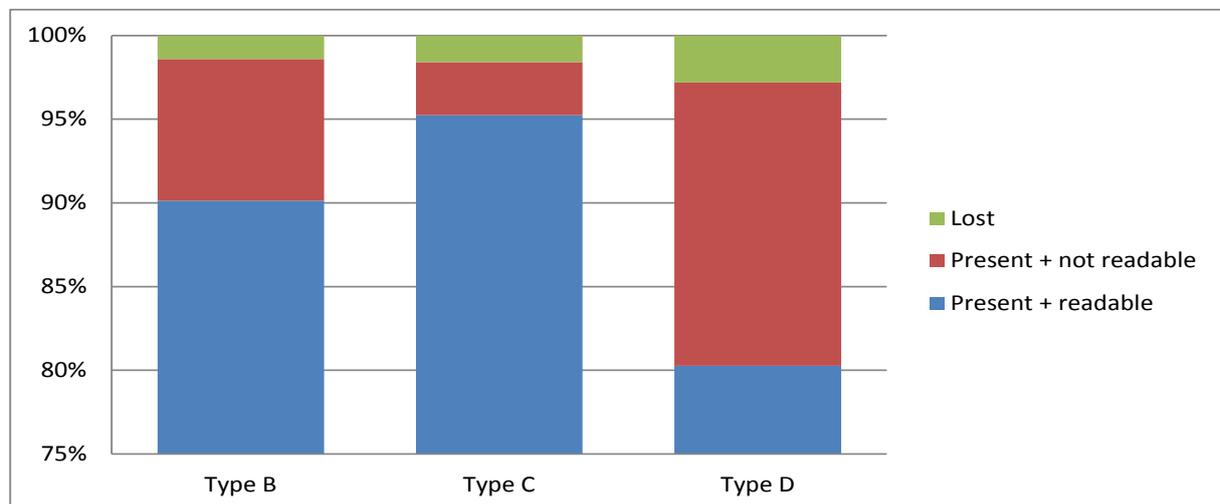


FIGURE 3: Physical and functional loss in the second trial in one slaughterhouse

4. Interviews for practical implementation

To get insight in the practical implementation issues of the combined ear tags interviews with government representatives (Dutch Ministry for Economics, Agriculture and Innovation, Dutch Food Authority), 6 pig farmers, VION, Dutch Association of Traders and the Dutch Product Board for Pigs were held. Focus in the in-depth interviews was on the regulations, the attachment of the combined ear tags, the process of transporting pigs to the

slaughterhouse, including transport, assembly and export, the need to renumber pigs, the service of the slaughterhouses for blood sampling, and the identification and registration (I&R) in relation to the needed documentation and forms during transport. and forms during transport. From the interviews it becomes clear that implementation in practice needs numerous reattachment and renumbering of ear tags. This retagging has negative influence on the reliability of the data and on the guarantees of food safety. This has negative influence on the reliability of the data, on the guarantees of food safety and can be a stressful experience for the animals and the persons handling the retagging.

5. Conclusion

The experimental and interview results leads to the overall conclusion that the introduction of a combined ear tag under current situations is not justified as a solution to go from three to two identification procedures for breeding pigs in the Netherlands. To maintain and guarantee food safety at the current level it is necessary to use sequential serial numbers for the pigs that will be transported to the slaughterhouses. This is only practical implementable with a lot of reattachments when the new combined ear tags will be introduced. This frequently used retagging is associated with light distress to both breeding pigs and people who have to retag. Then the intended gains in welfare for the pigs are not met. This conclusion was discussed and supported unanimously in the steering group. Drawback is that the desired solution and gain in animal welfare is not met in time for this specific group of breeding pigs.

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Reference list

Hoofs, A., P. Hogewerf, H. Hermans, M. Tijssen, H. Bloemenkamp, W. Zwanenburg, S. Korver, J. Merks en H. Olijslagers (2007); Implementatie Ingrepenbesluit (varkens); Intern rapport 200710, Animal Sciences Group Wageningen UR.

Lokhorst, Kees, Pieter Hogewerf, Anita Hoofs, Rik Verheijen and Bert Ipema (2011), Naar twee identificatie ingrepen voor fokvarkens: mogelijkheden van een combioormerk, Wageningen UR Livestock Research Rapport 537, 55p.

Regeling identificatie en registratie van dieren 2003. De Staatssecretaris van Landbouw, Natuurbeheer en Visserij, Tekst geldend op: 07-01-2004

RICHTLIJN 92/102/EEG VAN DE RAAD van 27 november 1992 met betrekking tot de identificatie en de registratie van dieren; DE RAAD VAN DE EUROPESE GEMEENSCHAPPEN,

Schuling, E., J. Verkaik, G. Binnendijk, P. Hogewerf, D. Smits, B. van der Fels (2003); Elektronische oormerken voor I&R bij schapen en geiten; Praktijkonderzoek – Praktijk Rapport Schapen 02.