



ELSEVIER

Animal Reproduction Science 85 (2005) 275–286

ANIMAL  
REPRODUCTION  
SCIENCE

www.elsevier.com/locate/anireprosci

## Piglets born after non-surgical deep intrauterine transfer of vitrified blastocysts in gilts

C. Cuello<sup>a,\*</sup>, F. Berthelot<sup>b</sup>, F. Martinat-Botté<sup>b</sup>, E. Venturi<sup>b</sup>,  
P. Guillouet<sup>c</sup>, J.M. Vázquez<sup>a</sup>, J. Roca<sup>a</sup>, E.A. Martínez<sup>a</sup>

<sup>a</sup> Department of Animal Medicine and Surgery, Veterinary Science, University of Murcia,  
Murcia E-30071, Spain

<sup>b</sup> UMR 6073 INRA-CNRS, F. Rabelais University P.R.C., 37380 Nouzilly, France

<sup>c</sup> UEICP INRA, 86480 Rouillé, France

Received 12 November 2003; received in revised form 14 April 2004; accepted 14 April 2004

### Abstract

The aims of this study were: (1) to evaluate the effect of the number of previous estrus of recipient gilts on effectiveness of intrauterine insertion of a flexible catheter designed for non-surgical deep intrauterine catheterization during diestrus in pigs; and (2) to determine the farrowing rate and the litter size after non-surgical deep intrauterine embryo transfer (ET) of porcine blastocysts vitrified by the open pulled straw (OPS) method. In experiment 1, 27 large white hyperprolific gilts (LWh) with 2–6 previous estrus were used. Intrauterine insertions of the flexible catheter were carried out at day 5.5–6 of the estrous cycle (D0 = onset of estrus). During insertions, no or only moderate reactions were observed in 88.9% of gilts and was not related ( $P > 0.05$ ) to the number of estrus prior to the insertion periods. The number of the estrus had a significant effect ( $P < 0.05$ ) on the difficulties found during the procedure. In the 100% of gilts with two estrus ( $N = 6$ ) it was not possible to insert the flexible catheter through the cervix. In gilts with three or more estrus, it was possible to pass the cervix and to progress along a uterine horn in 80.9% of the cases. In 86.7% of the gilts, the tip of the flexible catheter achieved the second or third quarter of the uterine horn. In experiment 2, following non-surgical deep intrauterine transfer of 20 vitrified/warmed blastocysts, 9 Meishan recipients (42.9%) farrowed an average of  $5.4 \pm 0.8$  piglets (range 3–9) of which  $0.6 \pm 0.3$  piglets (range 0–2) were born dead. In conclusion, this study shows that it is possible to obtain birth of piglets following non-surgical deep intrauterine embryo transfer (ET) of vitrified/warmed blastocysts. Non-surgical deep intrauterine ET and OPS vitrification methods are promising procedures to be used together for the introduction of new genetic material in a farm. © 2004 Elsevier B.V. All rights reserved.

**Keywords:** Pig-embryology; Vitrification; Embryo transfer; Intrauterine catheterization

\* Corresponding author. Tel.: +34-968364812; fax: +34-968367069.

E-mail address: ccuello@um.es (C. Cuello).

## 1. Introduction

The swine industry has a considerable interest for the use of embryo transfer and cryopreservation since these technologies may allow the transport and storage of valuable genetic material with minimal health risks and cost. However, the commercial and practical application of embryo transfer in pig has been traditionally limited due to the need of surgical transfer procedures and the difficulties for long-term storage of pig embryos.

New perspectives for embryo transfer (ET) have occurred with the development of non-surgical ET methods by several authors who have reported farrowing rates from 33 to 64% and litter size from 3.1 to 6.7 after ET in non-sedated recipient sows (reviewed by Hazeleger and Kemp, 2001). In these methods, embryos are transferred into the uterine body or beginning of a uterine horn. However, it has been shown after surgical ET that those places are less appropriate to deposit embryos than the middle or last third of the uterine horn (Wallenhorst and Holtz, 1999). Recently, a new device for non-surgical ET into the depth of one uterine horn in non-sedated sows and gilts has been designed (Martínez et al., 2001a). Using this procedure, a farrowing rate of 70.8% and a litter size of 6.9 have been achieved after transfer of fresh embryos.

While embryos of several domestic animals are routinely cryopreserved (reviewed by Dobrinsky, 2002), the application of this technology to swine embryos is still reduced. Pig embryos suffer from severe sensitivity to hypothermic conditions, which limit their ability to be cryopreserved by conventional slow freezing method. The development of vitrification as an alternative to traditional cryopreservation methods, specifically open pulled straw (OPS) technology (Vajta et al., 1997), has resulted in the highest farrowing rate and litter size (80% and 5.9 piglets, respectively) obtained after surgical transfer of cryopreserved porcine embryos (Berthelot et al., 2002).

The aim of this study was to determine whether or not the number of previous estrous in gilts affected the ability to insert a flexible catheter designed for non-surgical deep intrauterine catheterization during the diestrus in pigs and to determine the farrowing rate and the litter size by using blastocysts vitrified by the OPS method and non-surgical deep intrauterine ET.

## 2. Material and methods

### 2.1. Animals

The present work was conducted at the experimental farm of INRA Nouzilly (France). Large white hyperprolific (LWh) and Meishan cyclic gilts aged 5–10 months with a normal weight with respect to their breed and age were used in the experiments. Females were allocated individually to crates in a mechanically ventilated confinement facility under field conditions. They were fed a commercial ration twice a day and water was provided ad libitum.

#### 2.1.1. Experiment 1

Twenty-seven LWh gilts (at their second to sixth estrus) were used to evaluate the effect of the number of estrus of the gilt on intrauterine insertion effectiveness of the flexible catheter

Download English Version:

<https://daneshyari.com/en/article/9900369>

Download Persian Version:

<https://daneshyari.com/article/9900369>

[Daneshyari.com](https://daneshyari.com)