



AETE

Association Européenne de Transfert Embryonnaire
European Embryo Transfer Association

26^{ème} COLLOQUE SCIENTIFIQUE

26th SCIENTIFIC MEETING

*
* *

Dr Yvan HEYMAN

Special Celebration

* *
*

KUOPIO, Finland, 10th and 11th September 2010

EFFECT OF A DEFINED OR AN UNDEFINED *IN VITRO* MATURATION MEDIUM ON CLEAVAGE RATE AND EMBRYO DEVELOPMENT IN SHEEP

ALABART JL¹, LAHOZ B¹, FOLCH J¹, SÁNCHEZ P¹, ECHEGOYEN E¹,
COCERO MJ²

¹*Centro de Investigación y Tecnología Agroalimentaria (CITA) de Aragón, Zaragoza, Spain;*

²*Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA),
Madrid, Spain.*

Ovine oocytes matured *in vitro* are compromised in their developmental capacity compared with *in vivo* matured counterparts. While the causes of these differences are not fully elucidated, it is known that *in vitro* maturation (IVM) can be influenced by culture media composition and culture conditions used for IVM as well as by variations in oocyte quality. Follicular fluid (FF) is a natural medium of nuclear and cytoplasmic maturation of mammalian oocytes *in vivo*, suggesting that it may be suitable for oocyte culture. Epidermal growth factor (EGF) and follicle stimulating hormone (FSH) are also known to play a key role in nuclear and cytoplasmic maturation, and cysteamine (Cys) enhances glutathione synthesis, which is known to protect cells from oxidative damage. The aim of the present study was to compare the efficiency of a defined IVM medium (TCM199 supplemented with 100 µM Cys and 10 ng/ml EGF; Cys+EGF) with an undefined medium (TCM199 supplemented with 132 µg/ml pFSH and 10% FF; FSH+FF) for *in vitro* production (IVP) of ovine embryos, using abattoir-derived oocytes (170 COCs) from Rasa Aragonesa ewes.

Cleavage rates were 74.3% (52/70) and 80.0% (80/100) for Cys+EGF and FSH+FF groups, respectively (fresh semen; 2·10⁶ spermatozoa/ml). Blastocyst rates at day 8 were 40.4% in Cys+EGF and 33.7% in FSH+FF groups, with an increase of 5.8 and 3.7%, respectively, when compared with blastocyst rates at day 7. Final yield of embryo IVP was 30.0% (21/70) when Cys+EGF medium was used for IVM, and 27.0% (27/100) when using FSH+FF medium. Day 7 and 8 good morphological quality blastocysts were vitrified, and some of them were transferred to synchronized recipients, reaching 9.1% (1/11) and 10.0% (1/10) lambs born in Cys+EGF and FSH+FF groups, respectively. Differences were not significant between groups for any of the studied variables.

Under the experimental conditions of the present study, TCM199 supplemented with cysteamine and EGF is a convenient, defined, maturation medium for IVP of embryos from abattoir-derived oocytes that provides an efficiency equivalent to that achieved using supplementation with FF and FSH. Further studies are needed to elucidate the role of different factors in IVM in sheep and to check the efficacy of this defined medium with oocytes from different sources.