



HAL
open science

Bovine embryo cryopreservation in a chemically defined medium

A. Østergaard, L. Gavin-Plagne, M. Guedes Teixeira, S. Buff, T. Joly

► **To cite this version:**

A. Østergaard, L. Gavin-Plagne, M. Guedes Teixeira, S. Buff, T. Joly. Bovine embryo cryopreservation in a chemically defined medium. Annual Conference of the International Embryo Technology Society, Jan 2020, New York, United States. 32 (2), pp.142, 2020, 10.1071/RDv32n2Ab32 . hal-02450394

HAL Id: hal-02450394

<https://vetagro-sup.hal.science/hal-02450394v1>

Submitted on 22 Jan 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Bovine embryo cryopreservation in a chemically defined medium

A. Østergaard^{1,2}, L. Gavin-Plagne^{1,3}, M. Guedes Teixeira¹, S. Buff¹, T. Joly^{1,4}

¹UPSP ICE, VetAgro Sup, Marcy L'Etoile, France

²Gènes Diffusion, Douai, France

³IMV Technologies, L'Aigle, France

⁴ISARA Lyon, France

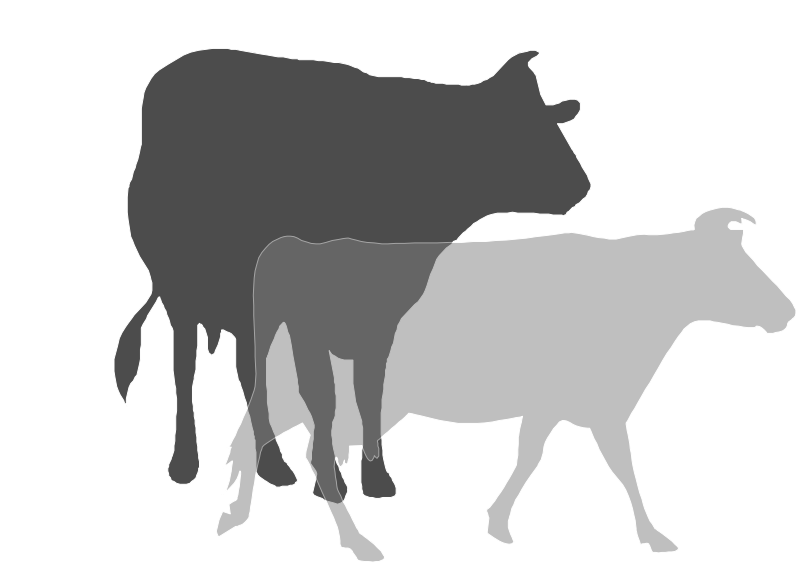
+33 6 21 75 77 04 | ostergaard@genepro-inc.com



CONTEXT AND OBJECTIVE

Embryo cryopreservation media often contain an animal-derived component, such as bovine serum albumin (BSA) or fetal calf serum. However, the industry is faced with the issue of composition variability between batches and, most importantly, the risk of pathogen transmission. The aim of this study was to compare the effectiveness of two embryo cryopreservation ethylene glycol-based media: IMV's freezing medium with BSA (IMV Technologies) and a chemically defined medium containing STEMALPHA.CRYO3, called CRYO3 (Ref 5617, Stem Alpha). CRYO3 is produced according to EU good manufacturing practice, ensuring the composition and quality of the product.

MATERIALS AND METHODS



10 commercial herds
60 donors
246 frozen embryos

BSA freezing medium (IMV Technologies, France)

CRYO3 synthetic freezing medium (20% CRYO3 ref5617 in DPBS)

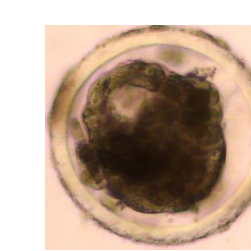
DPBS: Dulbecco's phosphate-buffered saline

In vitro assessment

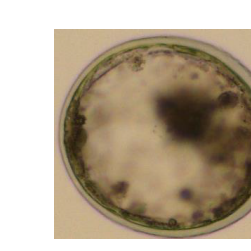
n=86 thawed embryos



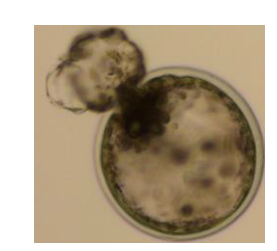
Survival rate at 24h



Expansion rate at 48h



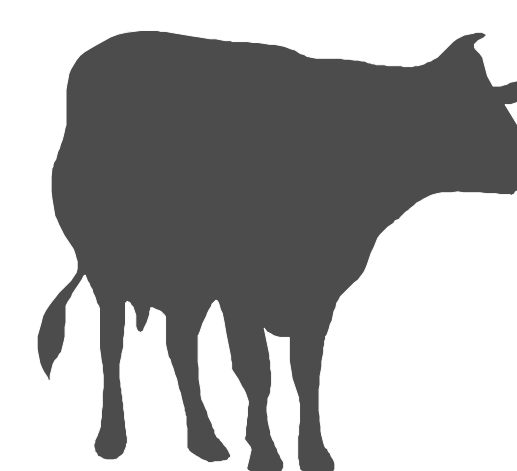
Hatching rate at 72h



1:1:1 mixture of RPMI, Dulbecco's modified Eagle's medium, and Ham's F10
Incubated at 38.5°C with 5% CO₂
Monitored every 24 hours for 72 hours

In vivo assessment

n=123 recipients (1 thawed embryo/cow)



Pregnancy rate Scan on D35-D50



Calving rate

Statistics: Chi-2 squared with Yate's correction

RESULTS

In vitro assessment

	Embryos thawed	Survival rate (24h)	Expansion rate (48h)	Hatching rate (72h)
BSA	44	50% ^a (n=22)	14% ^c (n=6)	18% ^c (n=8)
CRYO3	42	74% ^b (n=31)	38% ^d (n=16)	40% ^d (n=17)

Within columns, superscript with different letters are significantly different (p < 0.05)

In vivo assessment

	Recipients	Pregnancy rate	Calving rate
BSA	64	63% ^{ns} (n=40)	55% ^{ns} (n=35)
CRYO3	59	73% ^{ns} (n=43)	64% ^{ns} (n=38)

ns= nonsignificant

The trial was conducted with different AI teams and in 10 commercial herds, thus adding robustness to the data.

CONCLUSION

This study has shown that 20% CRYO3 in DPBS can replace BSA in an ethylene glycol cryopreservation medium for *in vivo*-produced bovine embryos. Therefore, this product eliminates a sanitary risk in embryo commerce, which is a concern in an international context.