

EMBRYO VIABILITY FOLLOWING STORAGE IN A NEW SYNTHETIC EMBRYO HOLDING MEDIUM (SYNGRO™)

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Introduction

A new holding medium for embryos of cattle, horses, sheep and goats was developed in collaboration with researchers at Colorado State University and Turretfield Research Center in Australia. The medium is based on a variation of synthetic oviduct medium that has proven highly suitable for long-term culture of embryos.

The key goal was to develop a highly efficacious holding medium for the short-term (<12 hours) storage of embryos at ambient temperature.

Due to growing international concern regarding the risk of disease transmission, **SYNGRO™** does not contain any substances of animal origin, including BSA. Recombinant derived Hyaluronan, a linear polysaccharide present in follicular, oviductal and uterine fluids has been added.

Embryos have been shown to have surface receptors for hyaluronan and it is involved in the regulation of gene expression, cell proliferation and cell differentiation. It has also been used very successfully as a replacement for serum or serum products in a number of embryoculture and freezing studies.

Lastly, **SYNGRO™** can be stored at room temperature long-term, greatly increasing the convenience of shipping and storage.

SYNGRO™ was thoroughly tested in the laboratory at CSU and by commercial embryo transfer practitioners over a wide area of North America.

Laboratory Study Design

Four replicates of 4 treatments, each totaling approximately 60 bovine embryos, were conducted at CSU. The embryos were incubated in **ViGRO™** or **SYNGRO™** holding media for 10 hours at either 25° or 37°C and returned to culture in an incubator in CDM-2 medium for 24 hours. Embryos were scored for quality and stage of development at the end of the 24 hour culture period.

Results

Embryo quality and stage of development were scored at the end of the 24-hour culture period using numerical values as defined by the International Embryo Transfer Society.

The results are shown in Table 1. There were no significant differences in embryo stage or quality after having been held in either of the two media for 10 hours.

Table 1. Storage of bovine embryos in ViGRO™ and SYNGRO™ holding media for 10 hours at two temperatures.

Medium	# of Embryos	23°C		37°C	
		Quality	Stage	Quality	Stage
ViGRO	60	Excellent	Excellent	Excellent	Excellent
SYNGRO	60	Excellent	Excellent	Excellent	Excellent

Field Study Design

SYNGRO™ holding medium was sent to a diverse group of practitioners who previously agreed to use the medium in their normal commercial embryo transfer procedures. Practitioners were asked to hold embryos in **SYNGRO™** either on the same day, or in a close time frame to when they used their standard holding medium.

TECHNICAL REPORT

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Results

As shown in Table 2, six practitioners in 6 commercial embryo transfer programs reported pregnancy results following the use of SYNGRO™ holding medium. In some cases, pregnancy rates were compared to the same-day use of other holding media and in other cases, the comparison was in a contemporary time frame.

In all cases, the practitioners reported that the SYNGRO™ holding medium performed as well as or better than the medium that they currently used.

Table 2. Pregnancy rates achieved following transfer of bovine embryos held in SYNGRO™ medium.

Location	(Number of Transfers) % Pregnant		
	Fresh Transfers	Frozen Transfers	Split Embryos
Quebec	(21) 48%		(10) 90%
CA	(6) 83%		
TX	N/A*		
PA	(21) 71%	(12) 100%	
PA	(16) 75%		
CO	(16) 63%		

*Specific numbers N/A, practitioner reported results as entirely satisfactory.

Discussion

The study was designed to determine whether or not SYNGRO™ medium provided a suitable environment for the short-term holding of bovine embryos.

In the laboratory study, the embryos were held for 10 hours at either 23°C or 37°C. It is noteworthy that SYNGRO™, with no components of animal origin, performed as well as the control media that contained BSA, even at the elevated temperature.

Although some practitioners used relatively small numbers of embryos, the field trial in its totality clearly demonstrated that SYNGRO™ can effectively replace other commercially available holding media.

SYNGRO™ provides protection against the accidental introduction of viruses that are known to sometimes be associated with BSA. In addition, the elimination of the necessity for refrigeration makes this product more convenient, less expensive to transport and store.