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FIRST TRANSFERS IN CUBA OF IMPORTED FROZEN EMBRYOS (IVF- TETF)

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Abstract: A total of 830 cows of the Zebu breed were reviewed in the provinces of Camagüey and Santiago de Cuba, of which 646 were synchronized by the method of the Bovine Intravaginal Device (D.I.B.), for Fixed-Time Embryo Transfer (T.E.T.F.). Ultrasound was used both for its selection and to evaluate the corpora lutea. The transfers of the 407 imported frozen embryos of the Brangus breed were carried out using the direct transfer system, similar to the thawing of semen in straws, with baths at 37 °C. The pregnancy diagnosis was made after 30 days post Transfers with ultrasonography, resulting in 127 Pregnant women, which represents 31.2%, despite all the difficulties that arose and it being the first time that a work was carried out in Cuba. of this magnitude with frozen IVF embryos, transferred by direct transfer and to recipients at a fixed time, outside the reproductive season. The results can be considered acceptable.

Keywords: Direct transfers, corpora lutea, embryo thawing, fixed time.

GOAL

To evaluate the results of direct transfers of frozen OPU-IVF embryos in recipients of the Zebu breed, synchronized for fixed-time transfers (T.E.T.F).

INTRODUCTION

Pacheco points out that embryo transfer is a reproductive biotechnology widely known and used in several domestic species, however, its use is still incipient in South American camelids. Latest publications are aimed at modifying the protocol for embryo production, superovulation, collection and embryo transfer to make them more accessible to carry out in field conditions, there are already successful experiences of the use of embryo transfer in commercial farms in camelids from Peru.

Embryo transfer and especially that of frozen bovine embryos, a product of in vitro fertilization, has had a considerable boom in recent times due to the benefits it is offering to the global livestock industry (Tribulo, 2008), mainly to improve and introduce new breeds of cattle, because the export and import of embryos is more attractive, easier and cheaper than that of live cattle. Also largely due to advances in freezing, thawing and synchronization techniques of recipients, for fixed-time embryo transfer (T.E.T.F.), which has made it possible to increase pregnancy rates that were initially low (Baruselli et al., 2010).

This has made it possible for this biotechnology to consolidate itself as a reproductive tool for the benefit of genetic improvement, reaching the point of revolutionizing reproduction and due to the high levels of efficiencies achieved in some countries such as Brazil, the United States and Canada, which has allowed them to become in large producers and exporters, to the point of even replacing A.I. on many elite livestock farms.

In Cuba, the in vitro production of embryos has been carried out since the 1990s, with the first births occurring as a result of this technology in those years and at the beginning of this century, OPU-IVF was introduced, achieving the first births in 2003 and although we continue in its implementation and development, the desired results have not yet been achieved, so intense work is being done to achieve them (Denis, 2000).

Although we have donated frozen embryos to several countries, such as Czechoslovakia, Viet Nam and the USSR, embryos had never been imported, making this work the first experience in that sense in the country for our specialists, who exchange them with those of others. countries.

MATERIALS AND METHODS

To carry out this work, a total of 830 cows of the Zebu breed were reviewed, of which 646 cows from the provinces of Camagüey and Santiago de Cuba were synchronized using the Bovine Intravaginal Device method, kept in natural mating systems, fed base of natural pastures, with extensive grazing in rustic units, lacking running water and electricity. We took into account what was pointed out by (Palma, G.A 2001) in relation to the fact that the synchronization of the recipients can be carried out with intravaginal implants, although it is more expensive, it has its advantages in the management of heat and others such as a lower incidence of ovarian cysts.

The direct transfer method was used to transfer the 407 frozen and imported Brangus breed embryos to the respective recipients, synchronized to transfer at a fixed time. The embryos were thawed directly in the genital organ of the cows, with an effect similar to that of semen in straws with a water bath at 37°C. To check their quality, about 10 embryos were observed with the stereoscope. Body condition was taken into account, both when selecting the recipients to be synchronized, and after synchronization at the time of transferring the embryo.

(Raúl De Armas et al, 2019) point out that the presence of a cavity in the CL at the time of selection of recipients for embryo transfer does not affect the results of Gestation in embryo transfer programs produced in vitro at a fixed time. For the selection of the recipients, as well as to determine the quality of the corpora lutea, with a size greater than 10 mm, we also use ultrasound, a modern technology that has revolutionized animal reproduction, increasing the diagnostic capacity of human doctors and veterinarians, although It does not completely replace the speculum, nor the Colposcope, it is an indispensable instrument

today for this work (Véliz, J and Álava, J. 2019). It was also used to make the diagnosis of Pregnancy after 30 days after Transfers. The parameters subjected to statistical analysis of comparison of proportions were the presence and quality of the corpora lutea, the type of gun used and the percentages of Gestation achieved, with results of medium significance.

RESULTS AND DISCUSSION

Zebu females are not recommended as recipients due to their nervous temperament, but in addition these females were in direct mating and their reproductive history and metabolic states were unknown, and they were out of the reproductive or mating season, which, according to (Álvarez et al., 2005) in cattle breeding is from June to September. Zebu cattle in Latin America and in general, like other breeds, present a non-negligible number of pathologies in their genital tract, which is why a prior review of each bovine female is necessary before being incorporated into an assisted reproduction plan. (Solorzano, J. 2018).

Table 5 (Annexes) shows the results of Gestation by dates, technicians and type of gun used in the Transfers. The best results were achieved in the month of October, both by the Uruguayans and by us. Thus, the worst results were achieved in the months of January and February with 22.7 and 25% respectively. Better efficiency is also evident with thin guns with 40.6% versus 23.3% with thick ones. It is appropriate to repeat that recipients of the Zebu breed are not the most advisable due to their temperament.

International literature reports that conception rates with embryos obtained by in vitro production are lower than those achieved with live embryos, even lower when they are frozen and transferred by the direct transfer system. (Gómez, 2018), a pioneer of biotechnology in Colombia, considers that it

is a technology that does not work properly in Colombia. He also states that in his personal experience, he has obtained on average 15%, that is, of the embryos that have passed through his hands, which he has transferred from different laboratories on livestock farms trying to obtain pregnancies, that is the statistics based on results of real cases, he also adds that a 20% pregnancy rate can be obtained in frozen in vitro embryo transfers. He adds that for a commercial program it must have a viability of at least 30%, if not, it is not a program as such, then he agrees with us that we achieved 31.2%.

Of the last 64 Transfers carried out, 27 were gestated for 45%, coinciding with the 45% reported by Embriobra, 2021, who carried out 82 Transfers and achieved 37 pregnancies with the same type of embryos, as well as the same transfer method, but with recipients. with much better conditions.

An influence is also observed on Gestation levels with respect to technicians and time in which the transfer was made, managing to gestate 57.1% among other variables as shown in the different Tables (Annexes), but

it is necessary to continue with the studies to expand, although it is advisable to expand the n of the variables under study to reach conclusive results.

CONCLUSIONS

The transfer of this quantity of frozen and imported embryos was a very positive experience for us, as well as an opportunity to check the status and technical level of our specialists. It contributed to the integration, as well as to strengthening the ties of cooperation and collaboration between the CIMAGT specialists and the Business Group for the Conservation and Protection of Flora and Fauna. Although we used Zebu cows with unknown reproductive histories as recipients, synchronized with DIB for T.E.T.F., transferring frozen IVF embryos to them, using the direct transfer method and performing the work outside the reproductive season, constitute negative factors, so the results of Gestation can be considered as acceptable, also providing experiences and benefits, placing us in a surprisingly favorable situation for future performance.

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ANNEXES

Place	Diagnosed Cows	Females selected for recipients	Transferred Recipients
Las Catalinas	264	166	72
San Manuel	108	86	89
Las Catalinas	124	98	75
La Estrella	168	108	75
Ramón de Guaninao	166	93	96
Total	830	551	407

Table 1. Selection and synchronization of receivers

Place	Synchronized Cows	Transferred recipients	Rejected Synchronized Females %
Las Catalinas	166	72	166/43,3
San Manuel	85	65	20/23,5
Las Catalinas	99	75	24/24,2
La Estrella	105	75	30/28,5
Ramón de Guaninao	91	56	35/38,4
Ramón de Guaninao	50	40	10/80
San Manuel	50	24	26/48
Total	646	407	311/48,1

Table 2. Transfers made by units

Place	Transfers performed	Receivers Pregnant women	% Gestation
Las Catalinas	72	31	43,6
Ramón de Guaninao	56	18	32,1
Ramón de Guaninao	40	17	54,2
La Estrella	75	20	26,0
Las Catalinas	75	16	21
San Manuel	65	13	20
San Manuel	24	11	45,8
Total	407	127	31,2

Table 3. Gestation Results of Transfers carried out by units

Gun Type	Transfers	Pregnant women	% Pregnant women
Slim	187	76	40,6
Thick	266	62	23,3

Table 4. Effect of the type of gun used

T.E. Time	Transfers	Pregnant women	% Gestation
Before 6:00 a.m.	21	7	33,3
From 6 to 8 a.m.	18	7	38,8
From 8 to 10 a.m.	15	6	40
After 10 a.m.	14	8	57,1

Table 5. Gestation results according to the time of the T.E.