

IETS Statistics and Data Retrieval Committee Report

The year 2009 worldwide statistics of embryo transfer in domestic farm animals

Prepared by Brad Stroud, DVM – Chairperson

Summary: Bovine *In Vitro* embryo production is gaining ground.

For the nineteenth consecutive year, the International Embryo Transfer Society (IETS) Statistics and Data Retrieval Committee has global embryo transfer (ET) statistics to report.

The number of bovine *in vivo* derived (IVD) embryos collected/flushed worldwide in 2009 was 702,000 compared to 746,000 embryos in 2008. That's almost a 6% decline. However, the number of embryos transferred is down by only 1% (from 539,000 to 535,000). North America reported the largest downward slide. A depressed US economy coupled with the discovery of some lethal recessive genes in a popular breed of beef cattle are some of the main reasons for the drop in volume of ET activity there. The number of frozen IVD embryos transferred outnumbered fresh transfers by almost 55,000 (297,000 frozen and 242,000 fresh).

The total number of transferrable bovine *in vitro* produced (IVP) embryos worldwide was 377,000 in 2009 compared to 331,000 in 2008. This represents a 12% increase in production. South America (mainly Brazil) again leads the global field of *in vitro* embryo production and transfers. The total number of IVP embryos transferred worldwide was 306,587.

Including *in vivo* and *in vitro* fresh and frozen, there were 47,143 more bovine embryos transferred in 2009 (841,540) as compared to 2008 (794,397). This represents a healthy 5.5% increase. Many data collectors could not separate beef and dairy embryo production so no attempt was made to estimate that ratio on a global basis.

If all species are considered including *in vivo* and *in vitro* production, there were **1,136,441 viable embryos collected / produced and 869,777 embryos transferred** into recipients.

Equine ET activity was down slightly in 2009. The number of reported flushes (36,955) was down by 7300 compared to 44,338 in 2008. However, the number of transfers (24,470) was only down by about 2500.

Small Ruminant ET activity was up by about 40% over the previous year. Australia was the clear leader in ovine embryo production and transfers. Swine ET activity is very low worldwide.

Introduction

The goal of the IETS Statistics and Data Retrieval Committee is to collect complete *in vivo* and *in vitro* embryo collection and transfer statistics from every ET practitioner in the world. So far, we have failed to accomplish those goals, but the previous chairperson of the committee, Dr. Michel Thibier of France, did a superb job creating data templates and selecting regional collectors who were willing to sacrifice their personal time calling on practitioners in their geographical areas to submit their previous year's information. Collecting data is a great challenge each year for everyone involved including the ET practitioners who have to dig into their last year's files and assimilate the requested data.

Countries that are members of regional ET societies or associations i.e., the American Embryo Transfer Association (AETA), the European Embryo Transfer Association (AETE), the Canadian Embryo Transfer Association (CETA), and the Society of Brazilian Embryo Technology (SBTE) to name a few, are well organized and have established collection protocols that make reporting consistent from year-to-year. However, the AETA currently requires only those members that are certified to report data. The non-certified members, who make up about 50% of the number of embryo transfer teams, are not required to report and very few actually do report their flush and transfer data. Additionally, many countries do not belong to associations and data collectors in those countries must call on the ET practitioners that they know personally to provide them with data. This requires a tremendous amount of effort on behalf of the regional data collectors, and in many cases not all practitioners are contacted. Certainly, much of the ET that is performed worldwide is not included in this report. However, efforts are on-going to improve the system of collecting ET data to provide the industry with more complete and accurate numbers.

Currently, ET data is collected by country and organized by continent. See Table 1 for a list of continents and their respective data. New this year, the statistics committee has produced a map of each continent (see Maps) with countries color coded yellow that submitted data by a resident practitioner for the 2009 calendar year. If you are an ET practitioner providing ET services or a cattle breeder that has ET performed on your farm or ranch and your country is not colored yellow, please contact the IETS at www.iets.org and tell them to put you in contact with the Chairman of the IETS Statistics and Data Retrieval Committee so your data and country can be officially recognized. Countries that are colored pale yellow had ET activity reported by a practitioner from another country in the 2009 season. White or non-colored countries did not report data. Also, tables 7-11 of this document displays the names of regional collectors and their respective countries so that ET teams in those areas know who to contact to submit data in the future.

1. Report of bovine *In Vivo* derived embryos in 2009

For the third consecutive year the reported number of flushes and the number of *IVD* embryos transferred into recipients has declined (Table 1). Although Asia, Europe, and Oceania have reported healthy increases in the number of flushes (18%, 13%, and 400% respectively), North America, South America, and Africa, all reported decreases. Overall, there was a 7% reduction in the number of flushes reported worldwide from 111,806 in 2008 to 103,851 in 2009.

Table 1. Bovine *In Vivo* Derived Embryo Activity in 2009

CONTINENTS	Flushes	Transferrable Embryos	Number of Transferred Embryos			
			FRESH	FROZEN	TOTAL & PERCENTAGE	
AFRICA	1,446	10,128	4,424	4,641	9,065	1.70%
ASIA	10,924	112,783	22,958	53,172	76,130	14.25%
EUROPE	16,856	106,495	43,999	51,074	95,073	17.80%
N. AMERICA	52,921	347,531	111,106	137,599	248,705	46.57%
S. AMERICA	11,634	65,221	42,486	16,546	59,032	11.05%
OCEANIA	10,070	60,200	18,522	27,573	46,095	8.54%
TOTAL	103,851	702,358	243,495	290,605	534,100	
2008 Totals	111,806	746,250	242,006	297,677	539,683	
Per Cent Decline	-7.12%	-5.88%	0.62%	-2.38%	-1.03%	

The most noteworthy decline in the number of flushes came from North America where there was a reduction of 16,277 from 2008 to 2009. The biggest decline in that region came from the US where there was a reduction of 15,147 flushes reported. That represents a 29% drop in one year. Mexico, under the direction of regional collector S Romo, has collected data from 14 ET teams which is the most from this country in the short history of this committee. Collectively, they reported 1875 flushes and 10,270 transferrable embryos collected. The ratio of beef to dairy donors flushed was about 2:1 in favor of beef. Close to 9000 bovine embryos were reported transferred in Mexico in 2009. That number however includes both *IVD* and *IVP* embryos. Even with a sharp decline in the volume of *IVD* embryos transferred in 2009 North America still accounts for nearly half of the reported *in vivo* derived embryo transfers worldwide. In the US, for at least a decade the ratio of beef to dairy collections has been 2:1. In 2009 that has changed to 1.5:1. There was a drop of 7,000 dairy flushes in 2009 and a drop of 9,000 beef flushes in the US. Mexico reported four times as many beef as dairy flushes. Canada reported a high preponderance of dairy to beef flushes (4.8:1 ratio) in 2009. The ratio in 2000 was about 3:1, so dairy is playing a more significant role in Canada in recent years.

Africa's flush numbers were down from 2389 in 2008 to 1446 in 2009. However, there was an increase in the number of frozen embryos transferred in 2009, which overall brought them back

equal to last year's overall number of transfers. The majority of Africa's ET data is generated from the Republic of South Africa.

Asian data generated in 2009 came exclusively from Japan. One hundred percent of the flushes and fresh transfers that were reported by Asia were done in Japan. Based on reported data Asia is responsible for transferring about 15% of the world's in vivo derived embryos. Japan showed an increase in flushes, fresh transfers, and frozen transfers. A serious effort to recruit data collectors from Asia is necessary. No doubt ET is being performed in at least some of the 44 countries in that continent that are currently not reporting. As of now there are only five countries with designated data collectors; Dochi from Japan, Nguyen from Vietnam, R Parnpai from Thailand, and Seok, Lee, and Son from S Korea, plus SN Lee from Taiwan. However, as previously mentioned, Dochi from Japan is the only one reporting data for the 2009 calendar year. There are reports from Parnpai that Thailand is trying to organize an ET society which will help them gather data from member practitioners in the future. Again, the committee urges anyone from an Asian country reading this report to volunteer their time as a data collector or point to someone who would be a good candidate.

Europe, a continent of 47 countries, has 25 countries with data collectors for AETE. As always, they are very thorough and prompt with their data reporting. The number of flushes is up from 2008 by 13% (from 14,894 to 16,856). Annually, Europe is responsible for transferring about 20% of the world's IVD embryos. As in previous years there were shifts among countries in Europe relative to the volume of embryos transferred. Some of the countries in Europe do not provide breed information, so comparing dairy and beef is difficult. France has rebounded from a sluggish year in 2008 with respect to the number of IVD embryos transferred. Some Russian data was reported by Canadian ET teams transferring 424 frozen embryos in that country. Neither the AETE nor this committee has a data collector from Russia. Perhaps the Canadians could provide a contact name for the committee. The committee thanks R. Mapletoft from Canada who was responsible for providing the Russian ET stats.

Table 2. The top twelve European countries ranked by number of In Vivo derived embryos transferred in 2009 (AETE, 2009).

Country	Number of Flushes	Number of Embryos Transferred	
France	6030	29218	↗
Netherlands	2788	16481	→
Germany	2445	14066	→
Italy	1922	10500	↘
UK	NA	4857	↘
Finland	436	4130	↗
Belgium	624	3150	↗
Switzerland	438	2718	→
Spain	687	2198	↘
Denmark	325	2133	↘
Ireland	338	1734	↘
Czech Republic	255	1719	↘

↘ denotes decrease from previous year. ↗ denotes increase over previous year.

Globally, more frozen *in vivo* derived embryos were transferred in 2009 than fresh embryos. That statistic held true for every continent except South America where four times as many fresh embryos were transferred than frozen. One of the reasons is due to the large number of available recipients in Brazil and Argentina. Also, many more *in vitro* produced embryos (see below) are transferred in Brazil where fresh transfers are preferred to frozen.

Table 3. The Top Five Countries Outside Europe and North America in 2009 (based on number of bovine *in vivo* embryos transferred)

Country	Number of Flushes	Number Bovine Embryos Transferred
Japan	10,924	75,706
Australia	10,020	46,095
Brazil	NA	42,383
Argentina	3846	14,385
S Africa	1,421	8,753

Brazil reported a significant drop of 25,000 in the number of *in vivo* derived embryos transferred in 2009. However, the difference was made up with 256,000 *in vitro* produced embryos being transferred, which was an increase of 34,000. Uruguay now has a regional data collector, S Kmaid, who reported 348 flushes of which 7% was dairy and 93% beef. Argentina

reported close to 450 dairy collections along with 3400 beef flushes. They also reported 14,385 fresh and frozen transfers.

Oceania, especially Australia, has a history of reporting only a small percentage of the ET that is actually done there. Although Australia has a veterinary society, the Australian Reproduction Veterinarians (ARV)) that encompasses the science of ET, a veterinarian must first be a member of the Australian Veterinary Association (AVA) before joining the ARV. There is also a contingency of non-veterinary ET practitioners that are not members of the veterinary association and are not organized. It's been very difficult for the regional collector, R Pashen, to communicate with both groups for some reason. As a result of the confusion the bovine data from Australia is not complete. There was no separation between dairy and beef ET activity in Australia. According to the regional data collector (L Frers) New Zealand does not flush many donors (35 dairy and 15 beef) in 2009, but leaned more towards *in vitro* embryo production using sex sorted semen.

Report of bovine *In Vitro* produced embryos in 2009

Globally, the number of *in vitro* produced (IVP) embryos was up by 46,000 (12%) from a year ago. Brazil was responsible for 68% of the IVP production, while Japan produced 21% of the world's IVP embryos. The number of *in vitro* produced embryos transferred also showed a healthy 17% increase from 254,000 in 2008 to 306,000 in 2009. One of the factors that could be attributing to a decrease in the *in vivo* activity of cattle worldwide is the increase of *in vitro* embryo production, especially in South America. Again, the one valuable resource that Brazil has that most other countries don't is a large number of recipients. With a national herd estimated at almost 200 million head, Brazil alone is amply supplied with potential recipients.

Table 4. Bovine <i>In Vitro</i> Produced Embryos in 2009					
Continents	Transferrable Embryos	Number of Transferred Embryos			
		FRESH	FROZEN	TOTAL &	PERCENTAGE
AFRICA	400	100	0	100	0.03%
ASIA (JAPAN)	80775	5923	7764	13687	4.47%
EUROPE (8 cts)	7653	2389	3419	5808	1.90%
N. AMERICA	20390	17850	807	18657	6.10%
S. AMERICA	256033	246260	10088	256348	83.79%
OCEANIA	11325	10666	683	11349	3.71%
TOTAL	376576	283188	22761	305949	

If one compares the number of *IVD* to the number of IVP produced embryos transferred annually over the past decade (see Chart 1) the lines are beginning to converge meaning that

the number of *in vivo* and *in vitro* embryos transferred could be on a collision course for similarity. However, Chart 2 illustrates that much of the *in vitro* production is coming from South America, mainly Brazil. Asia comes in second place, but their numbers of transferred IVP embryos are declining in recent years with China not reporting any data in 2009 after having reported over 50,000 *in vitro* produced embryos transferred in 2005. It's unsure whether their numbers have dropped or nothing is being reported. Currently there is no regional data collector for the country of China, so Chart 2 could be misleading as to the rise and fall of the transfer of *in vitro* produced embryos from Asia. The rest of the chart clearly shows that other continents are stable with the activity of IVP embryos, and the number of transfers is much lower in those regions of the world.

Chart 1. Comparison of the number of in vivo and in vitro embryos transferred annually for the past decade.

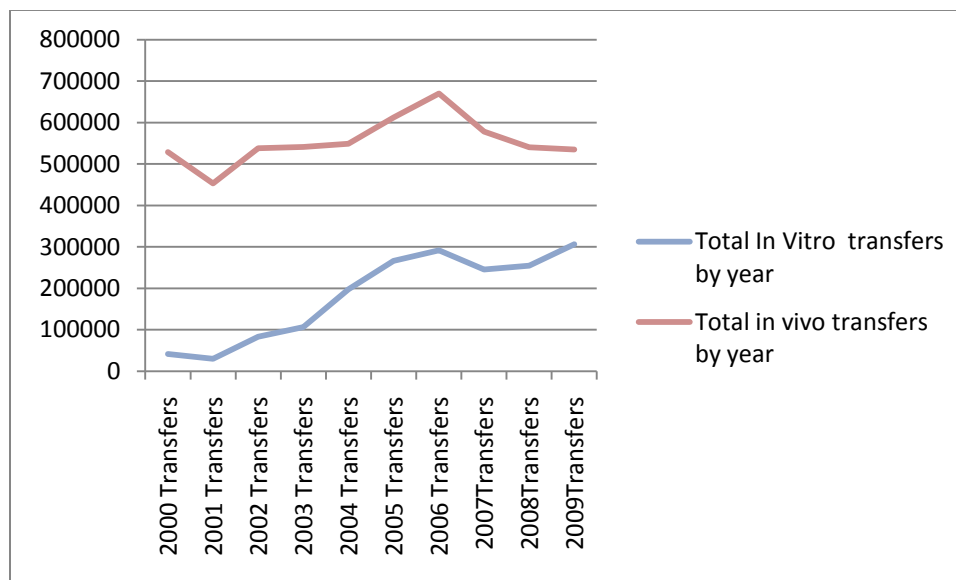
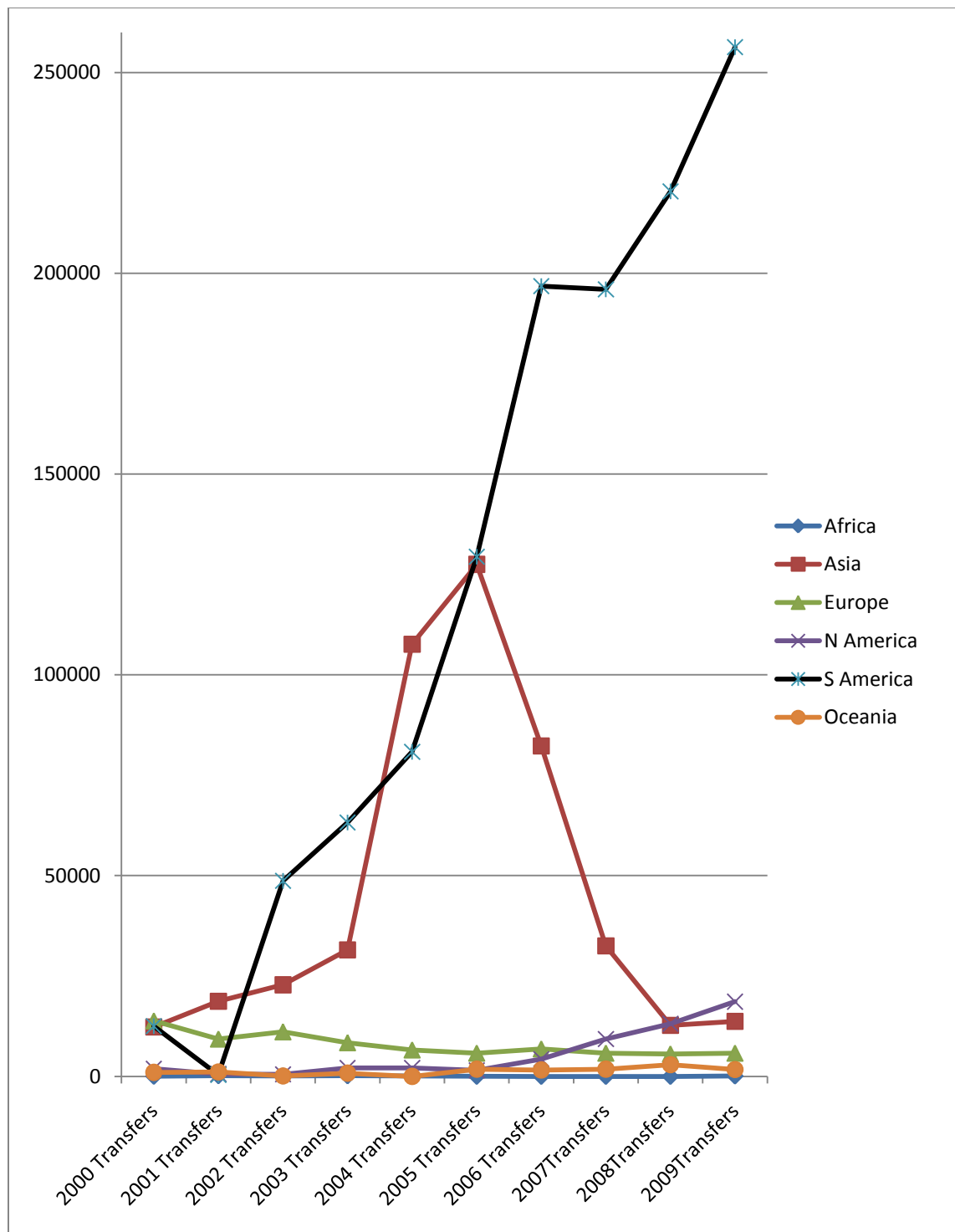


Chart 2. The trends of in vitro produced embryos transferred by continents since 2000



It will be interesting to see in the coming years if this shift in technology will continue to trend in countries other than those in South America and Asia towards the favor of *in vitro* embryo production.

The efficiency of frozen IVP embryos will likely determine the acceptance of *in vitro* technology by other countries. So far, the majority of the IVP embryos transferred have been fresh, not frozen. Data from Table 4 indicates that overall only 7% of the IVP embryos transferred in 2009 was frozen. However, that data varies according to different regions of the world. For example, Asia and Europe both reported that 58% of the IVP embryos transferred in those continents were frozen. That's very similar to the percent of *in vivo* embryos transferred that are frozen in those same regions. Consequently, North America (primarily the US) and South America (primarily Brazil) both reported that only 4% of the *in vitro* produced embryos that had been transferred were frozen.

In Europe eight of the twenty-five countries reporting ET statistics either produced or transferred *in vitro* produced embryos. Germany led with 3271 *in vitro* embryos produced, whereas Italy transferred the most IVP embryos – 2006. The Netherlands were second in both embryos produced and transferred (2377 and 1930 respectively).

Japan's *in vitro* production came mainly from abattoir derived oocytes, but they reported 1225 OPU sessions which produced 12,919 oocytes and 2256 transferrable embryos (17.5% efficiency). Additionally, they produced 78,519 viable embryos from 674,584 abattoir oocytes (11.6% efficiency). South Korea, who has reported *in vitro* production in past years, failed to report any ET data in 2009.

Of the five countries reporting from Africa only Kenya reported *in vitro* activity. They produced 400 IVP embryos of which one hundred were transferred fresh and the others were frozen.

Canada, USA, and Mexico, for the first time, all reported *in vitro* produced embryos from North America. Canada produced 564 dairy and 20 beef IVP embryos. All of the US *in vitro* produced embryos were a product of OPU. 4885 OPU sessions yielded 80,505 oocytes and 19,806 transferrable embryos for an efficiency rate of almost 25%, which could be misleading if some of the ET teams failed to report their oocytes and only reported transferrable embryos. Two ET groups in Mexico reported a combined 238 OPU procedures resulting in 617 transferrable embryos. Including transfer data from a third practitioner, Mexican teams reported 504 fresh IVP embryo transfers of which 86 were frozen abattoir derived IVP embryos.

Oceania produced a fair number of *in vitro* produced embryos. New Zealand reported 896 OPU sessions and 1725 transferrable embryos. Australia did not report the number of OPUs, but did produce 9600 transferrable *in vitro* produced embryos. **The reported total number of bovine *In Vivo Derived* and *In Vitro* Produced embryos transferred in 2009 worldwide was 841,540 which is an increase of ≈47,000 transfers from 2008 (794,397).**

2. The overall activity of ET in other species in 2009

In this report, statistics are recorded for three species of small ruminants; sheep, goats, and deer. The reported number of viable sheep embryos flushed in 2009 was 13,000 more than in 2008 (32,266 and 18,828 respectively). That's close to a 40% increase. The number of transfers in sheep was probably up too, but Australia did not report how many of their world leading 25,000 embryos collected were transferred. Most of those were probably transferred fresh, but this committee does not make such extrapolations. South Africa followed Australia in sheep embryo production. They flushed 925 sheep and collected 5426 viable embryos, but only transferred 35 fresh. Mexico was third with 170 flushes and 1056 transfers. In Europe, Turkey and the Czech Republic combined to collect 197 viable embryos, and transferred 143. R Mapletoft of Canada reported 137 flushes and 565 transferrable embryos recovered in his country. He also reported work done in Chile by a Canadian ET practitioner where 105 frozen embryos were transferred. Mapletoft also reported sheep ET performed in Mexico by a Canadian team. Forty donors were flushed resulting in 241 transferrable embryos of which all were transferred fresh. Mapletoft again reported a Canadian team transferring 104 ovine embryos in the Bahamas.

Table 5. Small ruminant ET activity in 2009

Species	Transferrable Embryos	Number of Transferred Embryos		
		FRESH	FROZEN	TOTALS
Sheep Total	32266	1326*	209	1535
Goat Total	2478	206	146	352
Deer Total	953	941	0	941
TOTAL	35697	2473	355	2828

*The number of sheep embryos transferred is misleading. Australia reported collecting 25,000 transferrable embryos from 4100 flushes in 2009, but no transfers.

Goat collections and transfers were also down significantly in 2009. Only 352 embryos were reported being transferred compared to an all time high of 20,000 in 2006. Although Australia reported collecting 450 caprine embryos they did not report any transfers. Goat embryo activity in the US is vastly underreported based on verbal communication of the committee chairperson with goat breeders across the country. Only a few bovine ET practitioners in the US are performing caprine ET. The small ruminant ET practitioners seem disinterested in joining the AETA so they don't get ET data surveys sent to them by the association. This is potentially a problem in other countries as well. However, the combined CETA/AETA 2010 annual conference has a small ruminant wet lab that could open the door to this group in the future at least in North America. Mexico reported 32 goat flushes resulting in 170 transferable embryos all of which were transferred fresh. Mapletoft again gets credit for reporting goat transfers in the United Arab Emirates by a Canadian team. They reported 19 flushes, 173 viable embryos recovered, and 36 fresh transfers.

The volume of cervid ET has remained constant from 2008 to 2009. New Zealand is the only country reporting cervid activity, but the regional collector in New Zealand was not the reporter. Instead, Mapletoft reported that one of his teams from Canada collected 953 in vivo produced embryos, and transferred 941 fresh embryos in that country.

The total number of **equine flushes** was down from 44,000 in 2008 to 37,000 in 2009. Based on the number of transfers the top three countries performing equine ET are Brazil (41% of world's activity), Argentina (31% of activity), and the United States (20% of activity). North America reported the largest drop from 13,500 to 10,000. P McCue, the new regional data collector from the USA did a thorough job of soliciting the equine breed associations in the US for accurate data. The American Quarter Horse Association (AQHA), which is the largest breed association that allows registration of ET foals, reported an all time high of 4069 ET foals in 2007. The last two years showed consecutive declines of ET foals of 3288 and 2458 respectively. Brazil remained stable with 14,100 flushes which was only 100 fewer than 2008. Argentina was down in flushes but stable with transfers. Canada was down from 42 mares flushed in 2008 to 26 in 2009. Collectively, Europe reported 1024 flushes in 2009, which was down from 1216 the previous year. Although the specific country is unclear, S Merton from Europe reported that 60 in vitro produced equine embryos were transferred in 2009 (Italy) which is up from 48 in 2008. There was no equine activity reported from Asia in 2009 or 2008. The Republic of South Africa was the only country reporting equine flushes in 2009 from the African continent. They more than doubled their 2008 count of 56 flushes to 120 in 2009. South America dominated the equine ET world by reporting 72% of all that species activity. Oceania, by way of Australia, reported 910 flushes (up from 24 in 2008) and 710 transfers.

Table 6. Equine ET Activity in 2009

COUNTRIES	Flushes	Transferrable Embryos	Number of Transferred Embryos			
			FRESH	FROZEN	TOTAL & PERCENTAGE	
ARGENTINA	10800	7560	7500		7500	30.65%
BRAZIL	14100	10100	10100	15	10115	41.34%
CANADA	26	22	22	0	22	0.09%
EUROPE	1024	1037	1037	0	1037	4.24%
SOUTH AFRICA	162	120	120	0	120	0.49%
AUSTRALIA	910	710	710		710	2.90%
USA	9933	4966	4966	0	4966	20.29%
TOTAL	36955	24515	24455	15	24470	
2008 Totals	44338	27082	26606	379	26985	

The reported number of swine flushes is down by 80% in 2009. The USA was largely responsible for the sharp decline. In 2008 the US reported 134 flushes, but only 9 flushes for 2009. Those 9

collections were reported by Mapletoft from Canada. It's unclear if swine ET activity is actually down or the data is not being reported. Again, the swine ET industry is not associated with the AETA in the USA, so the regional collector has no connections to anyone performing swine embryo transfers.

Table 7. Swine ET activity in 2009

Countries	Flushes	Transferrable Embryos	Number of Transferred Embryos			
			FRESH	FROZEN	TOTAL & PERCENTAGE	
CANADA	10	325	380		380	48.72%
CZECH REPUBLIC	NR	716	20	0	20	2.56%
USA*	9	132	0	0	0	0.00%
FRANCE**	10	325	380	0	380	48.72%
TOTAL	29	1498	780	0	780	
2008 Totals	149	3800	3092			

*All embryos exported **325 embryos exported

3. Stored Embryos

Stored embryos are essentially embryos that have been frozen and are being stored in liquid nitrogen Dewars. The numbers reported in this document are vastly underestimated at least for some countries. For example, this committee's regional/country collectors only ask for the number of embryos stored by the ET practitioners. It does not ask for the number of embryos stored by the animal breeders. In the US, most of the embryos are stored in animal owner's Dewars, and not the ET practitioner's.

Worldwide about 265,000 bovine embryos are reported being stored. It is difficult to statistically categorize the percentages of dairy from beef embryos being stored since many of the contributing ET practitioners simply categorized them together in their surveys. North America is the leading reporter of stored embryos totaling about 185,000 with 107,000 being dairy derived. Globally, about 1200 embryos of species other than bovine, mostly sheep and goats, were reported being stored.

4. Exports and Imports

Asia did not report any exported embryos in 2009. Africa exported 1170 beef embryos and 10 dairy embryos. They also exported 1914 sheep embryos. South America exported 214 beef embryos. Europe did not report any cattle embryo exports, but did report 248 swine embryo exports from the Czech Republic. Based on reported data, North America was the leading

exporter of bovine embryos in 2009 shipping 107,000 dairy and 7700 beef embryos. Canada reported 8900 dairy and 4800 beef embryo exports. The US reported 7400 dairy and 2900 beef exports. Mexico did not report any exports in 2009. North America also exported 457 swine embryos the majority of which originated from Canada.

As for imported embryos the following numbers represent actual number of imported and transferred embryos. Africa reported 1851 bovine imports of which most were beef (1750). In Asia, Japan was the leading importer of bovine embryos transferring 1486 (1402 dairy) embryos. Although Russia does not have a regional collector, Mapletoft of Canada reported that one of the Canadian ET teams transferred 424 beef embryos there. It's unclear if those embryos were imported from Canada or were frozen domestic embryos thawed and transferred by a Canadian practitioner. Neither North America nor Europe reported any imported embryos of any species. However, Mexico imported almost 1000 cattle embryos of which most were dairy (853). Mexico also imported 35 ovine and 15 caprine embryos. South America imported 121 bovine embryos (68 dairy, 53 beef). They also transferred 104 foreign sheep and 146 goat embryos. Australia estimated 7000 bovine imports coming from the following countries; USA, Canada, New Zealand, South Africa, and Europe. They also imported about 2000 ovine embryos from South Africa.

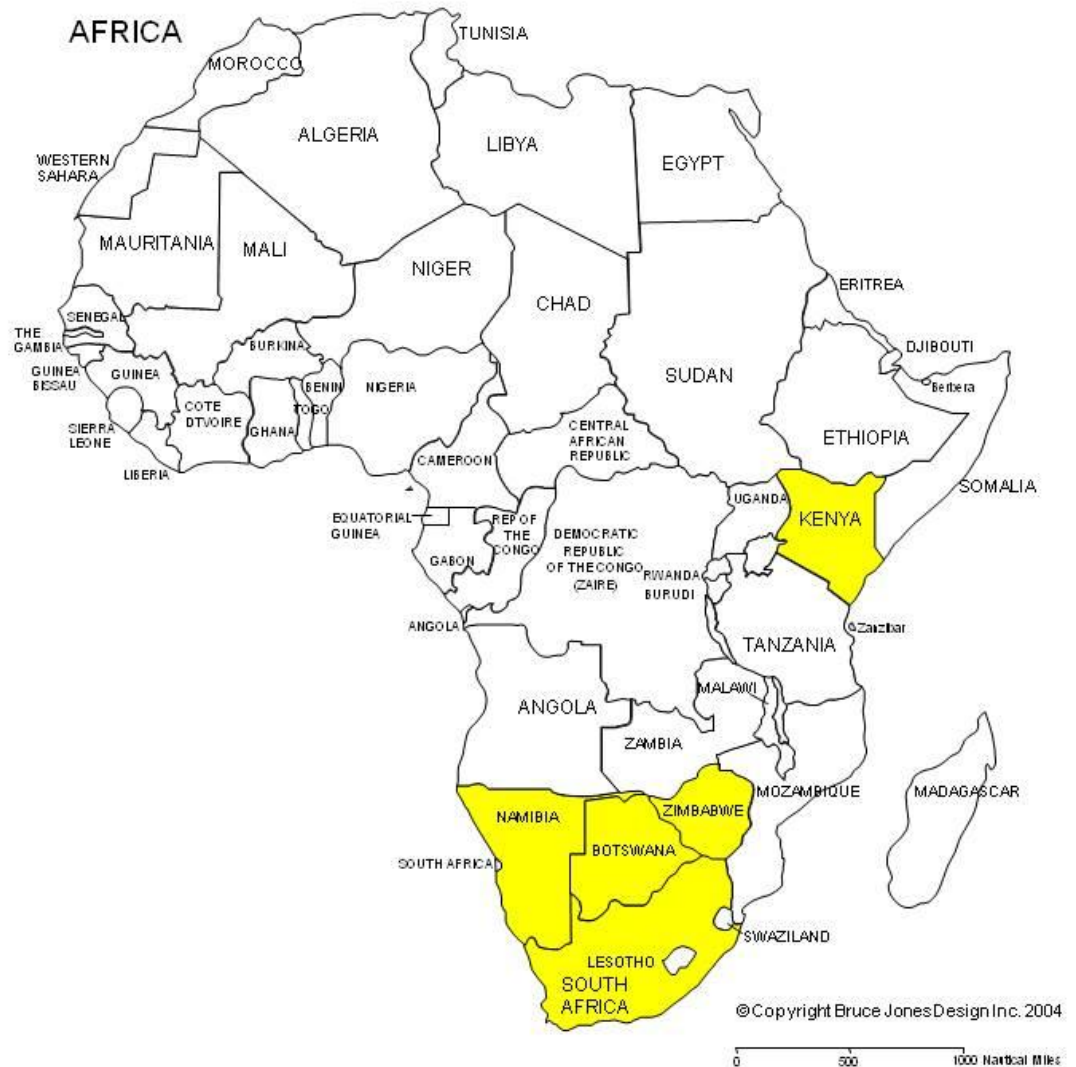
5. Global maps of ET activity

For a quick visual reference, maps of continents/regions have been created to indicate those countries that reported ET activity in 2009. Dark yellow means that the country has a regional data collector, and light yellow means the country had ET activity performed but reported by an ET team from a different country in 2009.

Definition of regions: the main regions of the world are, in alphabetical order Africa, Asia, Europe, North America, South America, and Oceania. For the purposes of this report North America consists of Canada, Mexico, and the United States. South America also includes countries of Central America, and the Caribbean Islands. There is a map in this report of the Middle East, which is essentially southwestern Asia and northern Africa. The reason it was included is because the UAE and Israel were not easily visible on the Asian map.

The Americas, (other than Central America) Europe, and Oceania are global regions that are largely represented by ET activity. However, Asia is likely underrepresented probably because of the lack of organization by the member countries. Hopefully, this report and the maps herein will entice cattle breeders, ET technicians, and intergovernmental organization officials like FAO/UN, World Animal Health Organization - OIE serving in those countries that are not currently reporting ET activity to contact the IETS and volunteer their time to collect data from other practitioners in their areas. **Not being a reporting (yellow) country could be costing**

those countries commercial opportunities since this report is available to breed associations, livestock breeders, embryo transfer organizations, government health organizations, and veterinarians worldwide who could be seeking to do business with countries already involved in embryo transfer.









North America



South America



Oceania



6. Countries and their regional data collectors in table format

Tables 7 – 11 are included in this report as a reference to continents and their regional and local data collectors. Anyone wishing to contribute ET stats in these geographical areas can contact these collectors through the IETS at www.iets.org.

Table 7

African Countries (53)	ET Activity	Collector
	Botswana	M. de la Rey
	Kenya	M. de la Rey
	Namibia	M. de la Rey
	Rep S Africa	M. de la Rey
	Zimbabwe	M. de la Rey

5 of 53 countries reported ET data in 2009

Table 8

ASIA (44)	ET Activity	Collector
	Japan	Dochi
	Russia*	Mapletoft
	United Arab Emirates**	Mapletoft

3 of 44 Asian countries reported ET activity in 2009*Russia's (light yellow) data was reported by Mapletoft via a Canadian ET practitioner doing work in Russia. ** UAE's (light yellow) data was reported by Mapletoft via a Canadian ET practitioner doing work in UAE. Also, see map of MIDDLE EAST.

Table 9**Europe (25 of 47 Countries Reported in 2009)**

Country	Collector
Austria	L Koucher
Belgium	P Vercauteren & I Donnay
Croatia	Dr. Martina Karadjole
Czech Rep	Dr. Jirina Peteliková
Denmark	Dr. Henrik Callesen
Estonia	Dr. Ulle Jaakma
Finland	Dr. Marja Mikkola
France	Dr. C Ponsart/Mapletoft
Germany	Dr. Hubert Cramer
Greece	Dr. Samartzi Fonteini
Hungary	Dr. Ference Flink
Ireland	Dr. Pat Lonergan
Israel	Dr. Yoel Zeron
Italy	Dr. Giovanna Lazzari
Luxembourg	Dr. Aline Lehnen
Netherlands	Dr. Sybrand Merton
Norway	Dr. Eiliv Kummen
Poland	Dr. Jędrzej Jaskowski
Portugal	Dr. Joao N Chagas e Silva
Romania	Dr. Stela Zamfirescu
Spain	Dr. Julio De la Fuente/Mapletoft
Sweden	Dr. Johanna Geust
Switzerland	Dr. Rainer Saner
Turkey	Prof. Ebru Emsen
UK	Dr. Ian Kippax

Table 10

N America (3)	ET Activity	Collector
	Canada	Mapletoft
	Mexico	S Romo
	United States	Wehrman

3 of 3 countries reported in 2009

Table 11

S America (12)	ET Activity	Collector
	Argentina	G Bo bovine L Losinno equine
	Brazil	M Alvarenga equine J Henrique bovine
	Chile	Mapletoft
	Colombia	Mapletoft
	Uruguay	P Bañales
	Bahamas	Mapletoft

6 of 12 countries reported in 2009

Table 12

Oceania (14)	ET Activity	Collector
	Australia	R Pashen
2 of 14 countries reported in 2009	New Zealand	L. Frer

7. A Call to ET Practitioners Throughout the World

Although the goals of the committee are lofty, disseminating accurate data is not just for the benefit of this committee or the IETS, but for everyone in the ET industry especially the practitioners. Every industry has its beginning followed by a plateau of activity, and eventually a decline and an end unless new technology can decrease production expense or create new commercial platforms for marketing advantages. Additionally, government and privately funded research grants are often based on industry demand and commercial opportunity. ET practitioners in all parts of the world should be keenly aware of the trends contained in this annual report. They should ask themselves the following questions: 1) is the industry shrinking, growing, or maintaining itself? 2) What is the demand for ET in different countries of the world from year to year? 3) Is there new technology on the horizon that may make my practice obsolete? 4) When should I incorporate those activities into my practice to keep from falling behind? Everyone in this industry depends on each other to sacrifice a few minutes each year and report their statistics. Whether you are a practitioner in a remote area in Australia, in a busy European community, or somewhere in Central America the industry needs your data.

Please be a contributor to the industry that provides your livelihood. Let this report be a call to all ET practitioners to submit their ET data every year.

8. Conclusion

The volume of ET activity reported from all the committee's regional data collectors indicates that the embryo transfer industry is doing well. As always some country's data is up and others are down. Anyone reading this report should take into consideration that it does not include every country's statistics, and very few, if any, country has 100% of its activity represented. To guess what percent of the world's actual ET is represented in this document would be unprofessional at best, so no attempt will be made to do so.

Perhaps one of the stumbling blocks that could be preventing practitioners from tackling the job of preparing stats each year is the complexity of several of the data points. For example, the number of total ova collected is not always documented by some practitioners on their flush forms. Also, the number of stored embryos could take several hours to inventory if they don't have sophisticated tracking software. At the next committee meeting we will address whether or not to eliminate some of the questions on the survey so that it isn't so daunting to the practitioner.

So that everyone reading this report will be clear on who the data collectors are for the countries and regions, tables 7 – 11 have them listed. These collectors can be contacted through the IETS. Practitioners not currently providing their stats are encouraged to be proactive and locate their regional collector and ask him or her for a survey.

9. Acknowledgments

The chairman would like to publically thank all the regional and country collectors that spend a considerable portion of their personal time each summer or winter (depending on the hemisphere) calling and emailing their fellow practitioners for all their data. Their names are listed in this report. It is a thankless job, but the Statistics and Data Retrieval Committee is perhaps one of the most important the IETS has. For 19 consecutive years the data has been gathered, assimilated, and published for the world to see. For as many man hours that it takes to prepare the report a great deal of gratitude should be given to those involved. Lastly, the author would like to thank Dr. Michel Thibier, the former committee chair, for his sincere dedication and time during retirement to help edit this report for accuracy and completeness. His value to the IETS lives on.