IETS 2011 Statistics and Data Retrieval Committee Report

The year 2010 worldwide statistics of embryo transfer in domestic farm animals

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Summary: 2010 global *in vivo* and *in vitro* embryo transfer activity up from 2009.

The year 2011 marks the 20th consecutive year that the International Embryo Transfer Society's (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 2010 increased to 732,000 compared to 702,000 embryos in 2009. That is a healthy 4.25% increase from the previous year. Consequently, the number of bovine *IVD* embryos transferred is up by a significant margin of 10.6% (from 534,000 in 2009 to 591,000 in 2010). All continents, with the exception of Africa, reported significant increases in the number of *IVD* embryos transferred. The number of frozen *IVD* embryos transferred into recipients outnumbered fresh transfers by 60,000 (328,000 frozen and 263,000 fresh). The trend towards more frozen than fresh transfers has held constant since the mid 1990's when embryos began to be frozen using the Direct Transfer method.

Worldwide, there were 61,000 beef donors flushed, and 43,000 dairy flushes. These numbers are slightly inaccurate due to the fact that the European bovine ET data was not separated into beef or dairy.

The total number of transferrable bovine *in vitro* produced (*IVP*) embryos worldwide was 451,000 in 2010 compared to 377,000 in 2009. This represents a 19.7% increase in *IVP* 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 in 2010 was 339,685 which is an increase of 11% from the previous year.

Including *in vivo* and *in vitro* fresh and frozen, there were 149,453 more bovine embryos transferred in 2010 (990,993) as compared to 2009 (841,540). This represents a very healthy 17.8% increase over 2009.

Global equine ET activity also increased in 2010. The number of reported flushes (41,652) +12.7% was up by 4681. The number of transfers (28,824) was also up by 4354. Brazil and Argentina led the way in mares flushed with 15,200 and 12,655 respectively. The US data remained stable for the 2010 calendar year. Small ruminant ET activity was down by about 7.3%

from 2009. Again, Australia was the leader in ovine embryo production and transfers. There was no swine ET activity reported and only a few cervid embryo transfers for the 2010 calendar year.

If all species are considered including *in vivo* and *in vitro* production, there were **1,243,500 (+ 9.4%) viable embryos collected / produced and 990,682 (+13.9%) embryos transferred** into recipients worldwide in the 2010 calendar year.

Introduction

The goal of the IETS Statistics and Data Retrieval Committee is to collect complete *in vivo* and *in vitro* bovine, equine, swine, and small ruminant embryo collection and transfer statistics from every ET practitioner in every geographical area of the world. 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 information.

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, 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. There is a map of each continent (see Maps) with countries color coded yellow that submitted data by a resident practitioner for the 2010 calendar year. Countries that are colored light blue had ET activity reported by a practitioner from another country in the 2010 season. White or non-colored countries did not report any ET activity. Also, tables 7-12 of this document displays the names of regional collectors and their respective countries so that new or existing ET teams in those areas know who to contact to submit data in the future.

1. Report of bovine *In Vivo* derived embryos in 2010

For the first time in four years the reported number of flushes/collections and the number of *IVD* embryos transferred into recipients increased (Table 1A). Although the number of bovine

embryo collections were up less than 1% the number of embryos transferred were up by over 10%. That's a substantial increase in one year. Frozen embryo transfers (+12.7%) made up most of that difference. One notable trend, with the exception of Africa, is that growth appears to be equally distributed across all continents with respect to the number of embryos transferred.

Table 1A. Bovine *In Vivo* Derived Embryo Activity in 2010

CONTINENTS	Flushes	Transferrable Embryos	Number of Transferred Embryos			
			FRESH	FROZEN	TOTAL & PERCENTAGE	
AFRICA	1,515	9,738	4,685	3,730	8,415	1.42%
ASIA	12,986	131,718	34,148	53,590	87,738	14.86%
EUROPE	17,694	117,813	48,555	60,859	109,414	18.53%
N. AMERICA	51,735	338,540	106,400	147,271	253,671	42.95%
S. AMERICA	12,263	77,643	47,353	24,205	71,558	12.12%
OCEANIA	8,458	56,775	21,895	37,870	59,765	10.12%
TOTAL	104,651	732,227	263,036	327,525	590,561	100.00%
2009 Totals	103,851	702,358	243,495	290,605	534,100	
Change	+0.77%	+4.25%	+8.03%	+12.70%	+10.57%	

Table 1B. 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	1.69%
ASIA	10,924	112,783	22,958	53,172	76,130	14.23%
EUROPE	16,856	106,495	43,999	51,074	95,073	17.77%
N. AMERICA	52,921	347,531	111,106	137,599	248,705	46.47%
S. AMERICA	12,065	67,093	42,876	17,220	60,096	11.23%
OCEANIA	10,070	60,200	18,522	27,573	46,095	8.54%
TOTAL	104,282	704,230	243,885	291,279	535,164	
2009 Totals	111,806	746,250	242,006	297,677	539,683	
Change	-6.73%	-5.63%	0.78%	-2.15%	-0.84%	

Africa's bovine flush numbers (M de la Ray) were up from 1446 in 2009 to 1515 in 2010. However, there was a decline of almost 600 IVD embryos transferred in 2010. Otherwise, ET data from Africa was stable compared to a year ago. As in previous years, the majority of Africa's ET data is generated from the Republic of South Africa.

Although all of the Asian data generated in 2009 came exclusively from Japan (Dochi), several other countries in Asia have reported data for the 2010 calendar year. For the first time Sun-Ho CHOI has reported ET activity from Korea. He reported 67 dairy flushes and 679 beef flushes. Almost 9000 *IVD* bovine embryos were transferred in Korea in 2010. Rangsun Parnpai reported 41 dairy and 85 beef flushes in Thailand. From those 126 flushes came 706 transferrable embryos. A total of 728 embryos, fresh plus frozen, were transferred in Thailand in 2010. R Mapletoft from Canada has reported that Canadian practitioners flushed 57 dairy donors (166 embryos) in 2010 and transferred 113 fresh embryos in China. He also reported 40 beef and 40 dairy donor collections in Russia. A total of 304 transferrable embryos were collected and 289 embryos transferred as a result of that work. Japan still dominates Asia in the amount of bovine ET performed in that continent. They showed a healthy increase of 700 flushes from 2009 (10,924) to 2010 (11,611). Based on reported data Asia is responsible for transferring about 15% of the world's *in vivo* derived embryos. The committee still feels that ET activities are ongoing in countries inside Asia, but are not being reported. As of now there are only five countries with designated data collectors in Asia; Dochi from Japan, Nguyen from Vietnam, R Parnpai from Thailand, Sun-Ho from Korea, plus SN Lee from Taiwan. 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 (collector H Knijn), a continent of 47 countries, had 21 countries (24 in 2009) that reported data for 2010. As always, they are very thorough and prompt with their data reporting. The number of flushes in 2010 (17,694) was up 838 from 2009 (16,856). Annually, Europe is responsible for transferring about 18% of the world's *IVD* embryos. Table 2 illustrates a few 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 not possible. France and The Netherlands continue to be the top two EU countries reporting ET data. Overall, European ET data had a healthy increase in 2010 compared to 2009.

Table 2. The top twelve European countries ranked by number of In Vivo derived embryos transferred in 2010 (AETE, 2010).

Country	Number of Flushes	Number Embs Transferred	
France	5714	29155	→
Netherlands	3499	20808	↗
UK	2527	14959	↗
Germany	2245	15553	↗
Italy	2039	11625	↗
Belgium	1174	7222	↗
Spain	577	2314	↗
Finland	486	3809	↘
Switzerland	467	3011	↗
Ireland	360	1612	↘
Denmark	347	2054	↘
Czech	229	1213	↘

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

Overall, the 2010 N American bovine ET data remained relatively constant, but there were some notable differences reported in 2010. In 2009 Mexico (S Romo) reported 1875 flushes and 8215 *IVD* embryos transferred, but only 197 flushes and 4041 transfers in 2010. Canada (R Mapletoft) was down from 2009 (13,348) to 2010 (12,956) by only about 300 flushes. Canadian transfer data were up slightly from 53,410 in 2009 to 55,136 in 2010. The US (M Wehrman) was up slightly in the number of flushes reported in 2010. In 2009 a total of 37,655 beef and dairy flushes combined were reported as compared to 38,552 in 2010. Likewise the number of transfers was up from 187,660 in 2009 to 194,794 in 2010. N America (Canada, Mexico, and US) continues to dominate the percentage (43%) of global bovine *IVD* embryos transferred.

South America (G Bo) has four new countries reporting data for 2010; Columbia, Ecuador, Peru, and Panama. The other S American country collectors are J Viana from Brazil, L Nassar from Panama, R Mancheno from Peru, P Bañalas and S Kmaid from Uruguay. For the S American continent G Bo reported a modest increase in the number of flushes from 2009 (11,634) to 2010 (12,263), but a substantial 21% increase in the number of *IVD* embryos transferred into recipients (from 59,032 in 2009 to 71,558 in 2010). Those numbers mean that S America transfers over 12% of the world's *in vivo* derived embryos. As for the number of *IVD* embryos transferred the reporting S American countries are ranked in order from first to last for data reported in 2010: 1) Brazil/38,975, 2) Argentina/24,263, 3) Uruguay/3402, 4) Columbia/2890, 5) Ecuador/675, and 6) Peru/108. Panama only reported *In vitro* produced embryo data.

Oceania (R Pashen/Australia and J Forsyth/N Zealand) reported decreases in the number of flushes 10,070 in 2009 vs. 8454 in 2010. However, the number of embryos transferred increased substantially from 2009 to 2010 from 46,095 to 59,765 respectively. As in last year's report it is worth mentioning that these numbers are greatly underreported for both countries. Australia is not well organized between the veterinarians and non-veterinarians, which makes it extremely difficult to gather stats from the latter group. Forsyth reported only 1 of 7 known team's data for 2010. It is unclear why the other six teams failed to report their ET numbers.

Globally, more frozen *in vivo* derived embryos were transferred in 2010 than fresh embryos (327,525 and 263,036 respectively). That statistic held true for every continent except South America where two times as many fresh embryos were transferred than frozen. The large number of available recipients throughout Brazil and Argentina is a likely reason for that.

The top five countries (table 3) outside N America and Europe has not changed in the last year.

Table 3. The Top Five Countries Outside Europe and North America in 2010 (based on number of bovine *in vivo* embryos transferred)

Country	Number of Flushes	Number Bovine Embryos Transferred
Japan	11,611	77,568
Australia	8,138	59,600
Brazil	5,996	38,975
Argentina	5014	24,263
S Africa	1,240	7,521

Report of bovine *In Vitro* produced embryos in 2010

Globally, the number of *in vitro* produced (*IVP*) embryos was up by 74,000 (25.9%) from a year ago. S America was responsible for 268,000 (59%) of the *IVP* production compared to 68% in 2009. Brazil, the clear global leader in *IVP* embryos produced 264,263 embryos. Brazilian ET practitioners transferred 252,048 fresh *IVP* embryos, and 12,214 frozen in 2010. Panama was also aggressive producing 2905 *IVP* embryos in 2010 which was their first year to report *IVP* embryos. Uruguay was the third leading S American country with 850 *IVP* embryos, and Argentina reported 292 embryos. Asia reported 117,000 *IVP* embryos (25% of world total). Japan was responsible for 68,000 of those embryos, but Korea is close behind reporting over 48,000 *IVP* embryos produced in 2010. Thailand showed some *IVP* activity producing 59 embryos. N America made 43,000 *IVP* embryos. The US reported 35,000 embryos (80%) of the N American total. Canada reported 7600 *IVP* embryos, and Mexico 481. That placed N America

in third place worldwide with 9.5% of the global production. The number of *in vitro* produced embryos transferred worldwide also showed a healthy 11% increase from 306,000 in 2009 to 340,000 in 2010.

Table 4. Bovine *In Vitro* Produced Embryos in 2010

Continents	Transferrable Embryos	Number of Transferred Embryos			
		FRESH	FROZEN	TOTAL & PERCENTAGE	
AFRICA	0	0	0	0	0.00%
ASIA	116614	15993	6510	22503	6.62%
EUROPE (8 cts)	7155	3412	2249	5661	1.67%
N. AMERICA	43058	25778	2322	28100	8.27%
S. AMERICA	268310	256888	12235	269123	79.23%
OCEANIA	15012	13644	654	14298	4.21%
TOTAL	450549	315715	23970	339685	100.00%
2009 Totals	376576	283188	22761	305949	
Per Cent Change	+19.64%	+11.49%	+5.31%	+11.03%	

Chart 1 compares the number of *IVD* to the number of *IVP* produced embryos transferred annually over the past decade. The lines are beginning to converge. However, Chart 2 illustrates that much of the *in vitro* production is coming from South America, mainly Brazil. 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. N America did show a small bump upwards in 2010. Time will tell if the rest of the world will follow Brazil in producing and transferring mostly *IVP* embryos.

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

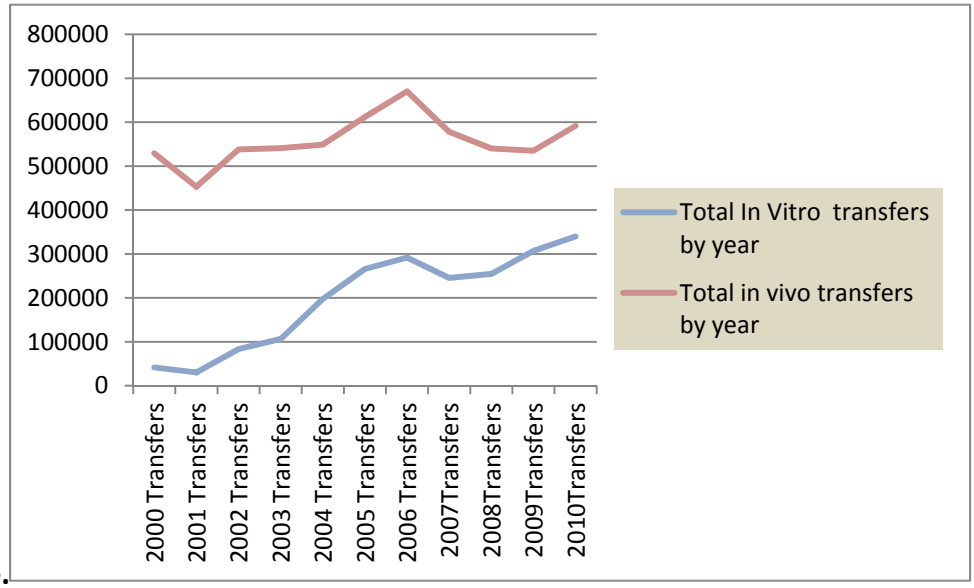
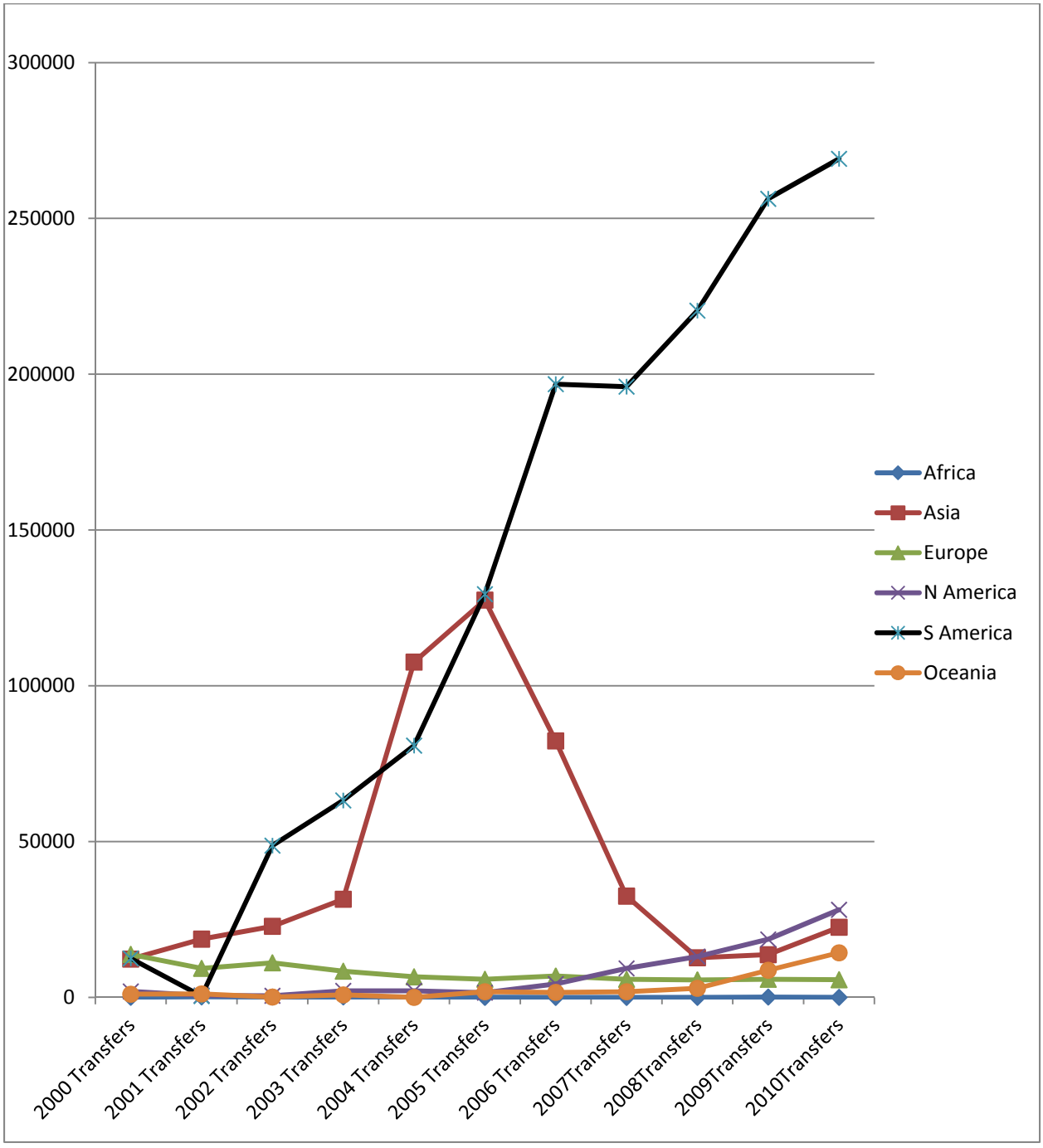


Chart 2. The trends of in vitro produced embryos transferred by continents since 2000



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So far, the majority of the *IVP* embryos transferred have been fresh, not frozen. Data from Table 4 indicates that worldwide only 7% of the *IVP* embryos transferred in 2010 was frozen. However, that data varies with different regions of the world.

IVP embryo production is growing geographically throughout the world. Africa was the only continent that failed to report any embryos produced *in vitro*. Japan, Korea, and Thailand all reported *IVP* embryos from Asia. In Europe five of the twenty-one countries reporting produced *IVP* embryos. The Netherlands led with 2863 embryos produced followed by Germany with 2148. Portugal followed with 1007. Italy was fourth with 681 embryos produced, then France with 315. As for the number of IVP embryos transferred into recipients in Europe seven countries reported data. The Netherlands topped the 2010 list by transferring 2593 embryos. Germany was second with 1481. Italy was a close third having transferred 1255 IVP embryos. From fourth through seventh in order was; France (311), Portugal (129), Estonia (17), and Switzerland (5). In N America all three countries reported IVP embryo production and transfers. The US produced 34,969 IVP embryos and 26,742 transfers. Canada reported 7608 IVP embryos produced. They also transferred 850 IVP embryos in 2010. From S America, Argentina, Brazil, Panama, and Uruguay all reported IVP activity in 2010. In Oceania Australia reported 12,000 IVP embryos and New Zealand 3012. New Zealand reported four times as many IVP embryos as IVD.

All of the US *in vitro* produced embryos were a product of OPU. Six thousand eight hundred and seventy-six (4885 in 2009) OPU sessions yielded 109,615 oocytes and 34,969 transferrable embryos for an efficiency rate of almost 32%. One ET group in Mexico reported 191 OPU procedures resulting in 481 transferrable embryos.

As previously stated Brazil is the major IVP player in South America, but it should be noted that Argentina reported 151 OPU sessions producing 292 embryos. Uruguay reported 96 OPU sessions producing 850 embryos. Panama was busy with 1030 OPU sessions yielding 13,180 oocytes and 2905 embryos.

The reported total number of bovine *In Vivo Derived* and *In Vitro* Produced embryos transferred in 2010 worldwide was 930,993 which was an increase of 87,131 transfers from the 2009 total of 843,862. That is a solid 10.3% increase overall.

2. The overall activity of ET in other species in 2010

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 2010 was almost identical to the 2009 data (32,768 in 2009 and 32,614 in 2010 (see Table 5). Although many were transferred in 2009, Australia did not report the number of sheep embryo transfers last year. In 2010 they

reported 24,170 transfers. Most of those were transferred fresh. The Republic of South Africa followed Australia in sheep embryo production. They transferred 3392 ovine embryos. For the second consecutive year Mexico was third with 1505 transfers. In 2010 the European countries of Turkey, Hungary, and the Czech Republic combined to transfer 446 ovine embryos compared to 143 in 2009. R Mapletoft of Canada reported 68 ovine flushes producing 335 embryos in Canada. He reported only 83 transfers for 2010. He also reported work done in Mongolia by a Canadian ET practitioner where 590 ovine embryos were transferred. Mapletoft also reported ovine ET performed in Sweden by a Canadian team in a project that transferred 125 embryos. Uruguay also reported transferring 544 sheep embryos in 2010. Lastly, New Zealand reported 109 ovine embryo transfers.

Caprine ET activity was most likely underreported for the 2010 year. Only 539 total goat embryos were reported as collected worldwide. Australia reported the most transfers (1200). That was followed by 290 transfers in Mexico, 200 in the West Indies (Mapletoft reported a Canadian team performing that work), 155 in S Africa, 93 in Mexico (Mapletoft/Canadian), 14 goat transfers in Mongolia (Mapletoft/Canadian), and 10 goat embryo transfers in the US in 2010. Caprine ET work in the US is grossly underreported.

Table 5. Small ruminant Global ET activity in 2010

Species	Transferrable Embryos	Number of Transferred Embryos		
		FRESH	FROZEN	TOTALS
Sheep Total	32614	26480	2598	29078
Goat Total	539	1619	14	1633
Cervids Total	0	0	84	84
TOTAL	33153	28099	2696	30711
2009 Totals	35697	2473	355	2828

Only 84 cervid embryos were reported being transferred in 2010 worldwide. Mapletoft reported that one of his teams from Canada transferred 84 embryos in Mexico. The rest of the world had no deer ET activity to report.

The total number of **equine flushes** increased from 36,955 in 2009 to 41,652 in 2010, which is a 12.7% increase. Based on embryos transferred the top three countries performing equine ET are Brazil, Argentina, and the US in that order. In 2010 Brazil equine ET practitioners transferred 14,422 embryos, which represented 43% of world's activity. Argentina reported 8226 embryos transferred. That equates to 29% of global activity. The United States was third again with 18% of the equine workload. It's worth noting that two years ago worldwide 24,000 mares were

flushed. It appears that equine ET is back on track in 2010. Brazil increased its flush numbers by about 1100 in 2010, and Argentina by about 1800. The US equine ET data was actually estimated for the 2010 year due to an unfortunate fire that occurred at the Colorado State University (CSU) Equine Reproductive Center. P McCue, the Director of that facility, is the US equine data retrieval representative for this committee. Unfortunately, he was too involved with organizing the CSU breeding center's after effects of the fire to do an accurate survey for the 2010 ET season. So, his 2010 data was estimated to be identical to the 2009 data. Canada was up from 26 mares flushed in 2009 to 42 in 2010. Europe reported 1024 flushes in 2009, but only 385 in 2010. That's a significant drop of 639. Europe reported 1216 flushes two years ago (2008). The Czech Republic, Hungary, Italy, and Portugal are the countries in Europe that reported Equine ET activity in 2010. For the second consecutive year there was no equine activity reported from Asia. The Republic of South Africa was the only country reporting equine flushes in 2010 from the African continent. They did 127 flushes in 2010. That's seven more than in 2009. Australia, reported a huge increase in the number of equine flushes (3300 in 2010) compared to 910 in 2009. Perhaps the most notable bit of data from Australia is that ET practitioners transferred as many frozen equine embryos as fresh (1230 of each).

Table 6. Equine ET Activity in 2010

COUNTRIES	Flushes	Transferrable Embryos	Number of Transferred Embryos			
			FRESH	FROZEN	TOTAL & PERCENTAGE	
ARGENTINA	12655	8480	8226	0	8226	28.54%
BRAZIL	15200	12400	12400	22	12422	43.10%
URUGUAY	10	5	5	0	5	0.02%
CANADA	42	32	32	0	32	0.11%
EUROPE	385	289	123	0	123	0.43%
SOUTH AFRICA	127	95	95	0	95	0.33%
AUSTRALIA	3300	1230	1230	1230	2460	8.53%
USA	9933	4966	4966	495	5461	18.95%
TOTAL	41652	27497	27077	1747	28824	126797
2009 Totals	36955	24515	24455	15	24470	110410

Unfortunately, there was no swine ET activity reported from any continent or country in 2010. In 2008 the US reported 134 flushes, but only 9 flushes for 2009. It's unclear if swine ET activity is actually down or the data is not being reported. This committee is in desperate need of regional data collectors of swine ET data.

3. Stored Embryos

The committee has elected to discontinue reporting the number of embryos stored in liquid nitrogen. The reason is that the number that is actually stored is vastly underreported. 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. Since most embryos are stored in animal owner's Dewars, and not the ET practitioner's, it would be misleading to report only the number stored by practitioners. Also, many practitioners do not have software that keeps an accurate count of stored embryo inventories. Therefore, this portion of the report will be omitted in the future.

4. Exports and Imports

Worldwide there were 19,878 dairy and 16,819 beef embryos (total of 36,697) exported in 2010. There were 2744 sheep and 621 goat embryos exported. Considering all species there were 40,062 total embryos exported in 2010. Holding true to previous years Asia did not report any embryos exported in 2010, but Mongolia (Mapletoft) did report 590 ovine and 14 caprine embryos imported. S Africa exported 753 beef embryos in 2010. That's a 417 embryo decrease from 2009. They also exported 1744 sheep embryos (1914 in 2009), and 621 goat embryos in 2010. South America reported some export activity in 2010. Argentina and Uruguay exported beef cattle embryos in 2010 (2446 and 128) respectively. Additionally, Uruguay exported 923 dairy embryos. Columbia exported 160 beef embryos. Australia was very busy with embryo exports in 2010. They reported 750 dairy embryos, 4500 beef embryos, and 1000 sheep embryo exports. New Zealand added 310 dairy exports to the Oceania total of 6560. Last year they reported 214 beef embryos and 214 sheep embryos. Europe did not report any cattle embryo exports in 2009 or 2010. North America was the leading exporter of bovine embryos in 2010 shipping 17,895 dairy and 8832 beef embryos (26,727 total). This is a good place to make a correction in the 2010 committee report (2009 ET data). Last year's report mistakenly states that N America exported 107,000 dairy embryos. The correct number is 16,297 exported dairy embryos for the 2009 calendar year. The number of dairy embryos stored in 2009, not exported, in N America was 107,000. Canada reported 8178 dairy and 4894 beef embryo exports in 2010. The US reported 9719 dairy exports in 2010, which is up from 7400 in 2009. The US also reported 3938 beef exports (up from 2900 in 209). Mexico did not report any exports in 2010. N America exported 73% of the world's total for 2010.

In previous annual reports the number of imports has been included. However, the import-to-export ratio, which should be 1/1 is grossly uncorrelated. Very few practitioners ever report the number of embryos imported, so the committee will refrain from reporting imports unless the data is meaningful, i.e., a new country that has never reported any ET activity reports import data. In 2010 Sweden was such an example. They imported and transferred 125 ovine embryos. A Canadian practitioner reported the work, but failed to clarify where the embryos originated.

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 2010. Yellow means that the country has a regional data collector and actually reported ET activity. Light blue means the country had ET activity performed but reported by an ET team from a different country in 2010.

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.

The Americas, other than Central America, along with 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.**

Africa remained stable in 2010 with the same 5 countries reporting for the last several years.

Asia improved its colors in 2010 by adding two new countries reporting in-country ET; Thailand and Korea has their own regional collectors, so they are now yellow along with Japan. Also, China, Mongolia, and Russia had ET performed and reported by Canadian ET practitioners, so they are now light blue countries. We strongly encourage those countries to get their own regional/country data collector to begin reporting to the IETS annually.

Europe lost three yellow countries in 2010; Austria, Romania, and Sweden. However, Sweden had some ET work performed by a Canadian team, so they are a blue country for 2010.


North America
Arctic Ocean
GREENLAND
(Denmark)
ICELAND
Ellesmere Island
Barrow
Nome
Bearfort Sea
Baffin Bay
Banks Island
Alaska
(USA)
Victoria Island
Baffin Island
Godthaab
Davis Strait
Anchorage
Great Bear Lake
Labrador Sea
Whitehorse
Yellowknife
Great Slave Lake
Hudson Bay
Uranium City
Goose Bay
St John's
Lake Athabasca
Churchill
Prince Rupert
CANADA
FortGeorge
Edmonton
Sydney
Lake Winnipeg
Vancouver
Calgary
Saskatoon
Quebec
St John
Halifax
Regina
Winnipeg
Thunder Bay
Lake Superior
Montreal
North Pacific Ocean
Seattle
Lake Huron
Ottawa
Portland
Great Falls
Toronto
Boston
Boise
Minneapolis
Lake Michigan
Detroit
Lake Ontario
New York
North Atlantic Ocean
Chicago
Cleveland
Philadelphia
Lake Erie
Washington D.C.
Salt Lake City
Omaha
San Francisco
Denver
St. Louis
Louisville
Las Vegas
UNITED STATES
Los Angeles
Albuquerque
Little Rock
Atlanta
Charleston
San Diego
Phoenix
Dallas
Jacksonville
El Paso
New Orleans
Houston
Chihuahua
Miami
Gulf of Mexico
CUBA
La Paz
MEXICO
JAMAICA
Tampico
Mérida
Guadalajara
Mexico
Veracruz
Caribbean Sea
BELIZE
Acapulco
Oaxaca
HONDURAS
GUATEMALA
EL SALVADOR

South America

South America gained five new countries for 2010; Columbia, Ecuador, Panama, Peru, W Indies

Oceania

Oceania remained stable with both Australia and New Zealand reporting data again for 2010.

6. Countries and their regional data collectors in table format

Tables 7 – 12 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 2010

Table 8

ASIA (44)	ET Activity	Collector
	China	Mapletoft
	Japan	Dochi
	Korea	Sun Ho CHOI
	Mongolia	Mapletoft
	Russia	Mapletoft
	Taiwan	SN Lee
	Thailand	R. Parnpai

7 of 44 Asian countries reported ET activity in 2010.

Table 9

Europe 21 of 47 Countries Reported in 2010

Country	**Country Collector**
Belgium	**Drs. P Vercauteren & I Donnay**
Croatia	Dr. Martina Karadjole
Czech Republic	Dr. Jirina Peteliková
Denmark	Dr. Henrik Callesen
Estonia	Dr.Jevgeni Kurokin
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. Jacob Westphal
Netherlands	Drs. Tom Otter
Norway	Dr. Eiliv Kummen
Poland	Dr. Jedrzej Jaskowski
Portugal	Dr. Joao N Chagas e Silva
Spain	Dr. Julio De la Fuente
Switzerland	Dr. Rainer Saner
Turkey	Prof. Ebru Emsen
UK	Dr. Ian Murphy

Table 10

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

3 of 3 countries reported in 2010

Table 11

S America (12)	ET Activity	Collector
	Argentina	G Bo bovine L Losinno equine
	Bahamas	L Nassar
	Brazil	M Alvarenga equine Joao H M Viana bovine
	Colombia	G Bo
	Ecuador	G Bo
	Peru	R Mancheno
	Uruguay	P Bañales, S Kmaid
	West Indies	Mapletoft

8 of 12 countries reported in 2010

Table 12

Oceania (14)	ET Activity	Collector
	Australia	R Pashen
2 of 14 countries reported in 2010	New Zealand	J Forsyth

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. For questions about submitting data please contact www.iets.org or brad@stroudet.com .

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 worldwide. As always some country's data is up and others are down, but fortunately most are up from a year ago. 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.

To make it easier for ET practitioners to collect data the number of total ova collected is no longer requested by the committee. Also, the number of stored embryos is no longer a part of the survey. This should eliminate a significant amount of time for each ET team to gather and report their stats each year.

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 20 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 for his help editing this report for accuracy and completeness.