

2014 Statistics of Embryo Transfer Activity in Europe

Collected by Marja Mikkola, Finland, AETE board member

National data collectors 2014

Country	Collector	N° of approved ET teams	N° of ET teams providing data
Austria	Friedrich Führer	5	
Belgium	Peter Vercauteren/ Isabelle Donnay	9	8
Bosnia & Herzegovina	Teodor Markovic	1	1
Czech Republic	Pavel Bucek		3
Croatia	Mario Matkovic		
Denmark	Henrik Callesen	8	8
Estonia	Jevgeni Kurykin	1	1
Finland	Seija Vahtiala	4	3
France	Serge Lacaze	19	15
Germany	Hubert Cramer	39	17
Greece	Foteini Samartzi	2	2
Hungary	Ferenc Flink	4	2
Ireland	Pat Lonergan	10	4
Italy	Giovanna Lazzari		
Kazakhstan	Zhanserik Asanov	2	1
Latvia	Vita Antane	1	1
Lithuania	Giedrius Palubinskas, Vytuolis Zilaitis, Jonas Kutra	1	1
Luxembourg	Marianne Vaessen	2	2
The Netherlands	Helga Flapper	6	6
Norway	Eiliv Kummen		
Poland	Jedzej Jaskowski	7	7
Portugal	Joao das Chagas e Silva	11	6
Russian Federation	Denis Knurov	7	5
Slovenia	Janko Mrkun	1	1
Spain	Santiago Fuentes	21	11
Sweden	Charlotte Andersson	2	2
Switzerland	Rainer Saner	7	4
Turkey	Ebru Emsen	2	1

Bovine *In vivo* embryo production 2014

Country	N° of embryo collections	N° of embryos collected	N° of transferable embryos	N° of transferable/flush	% of collections with sexed semen	Distribution of breeds, % of collections (dairy/ beef / dual purpose)
Austria	212	2390	1578	7.4	1.4	14.2 / 9.9 / 75.9
Belgium	1064	6617	5138	4.8	0.9	17.5 / 82.5 / 0
Czech Republic	4	50	28	7.0	0.0	0 / 25.0 / 75.0
Denmark	642	5862	4428	6.9	0.3	91.4 / 8.6 / 0
Finland	459	5299	3617	7.9	18.5	99.8 / 0.2 / 0
France	6859	66403	37811	5.5	10.4	82.2 / 17.8 / 0
Germany	2904	27760	17877	6.2	-	78.9 / 0 / 21.1
Hungary	76	1010	675	8.9	-	17.1 / 76.3 / 6.6
Ireland	610	6161	3721	6.1	-	-
Italy	2218	26728	17726	8.0	-	97.7 / 2.3 / 0
Kazakhstan	82	509	420	5.1	0.0	47.6 / 52.4 / 0
Lithuania	85	605	447	5.3	0.0	84.7 / 3.5 / 11.8
Luxembourg	189	2031	1282	6.8	3.2	97.4 / 2.6 / 0
The Netherlands	5220	33096	32556	6.2	-	-
Norway	10	-	-	-	-	-
Poland	167	1449	1098	6.6	3.6	100.0 / 0 / 0
Portugal	71	869	494	7.0	2.8	97.2 / 2.8 / 0
Russian Federation	477	3058	2746	5.8	0.0	83.9 / 16.1 / 0
Slovenia	5	14	10	2.0	0.0	100.0 / 0 / 0
Spain	575	5237	3002	5.2	15.8	84.3 / 15.7 / 0
Sweden	100	738	395	4.0	18.0	92.0 / 8.0 / 0
Switzerland	461	5053	3369	7.3	8.2	94.1 / 2.6 / 3.3
Total	22490	200 939	138 418	6.2		

Countries reporting no activity in bovine embryo collections:
Bosnia Herzegovina, Croatia, Estonia, Greece, Latvia, Turkey

Bovine *In vitro* production, OPU

Country	N° of OPU sessions	N° of oocytes collected	N° of transferable embryos
France	159	1300	610
Germany	1907	3632	2853
Italy	654	10310	1518
The Netherlands	5060	43825	5815
Portugal	15	132	1
Spain	896	13178	1898
Russian Federation	1019	11408	2998
Total	9710	83785	15693

Bovine *In vitro* production, “slaughtered donor”

Country	N° of oocyte donors	N° of oocytes collected	N° of transferable embryos
Czech Republic	35	526	223
France	1	5	1
Germany	28	2480	183
Italy	21	780	111
Lithuania	3	11	0
The Netherlands	106	21103	266
Portugal	1141	12389	557
Switzerland		120	28
Total	1335	37414	1369

Bovine Embryo Technologies

Country	N° of sexed embryos (via biopsy)		N° of genotyped embryos	
	In vivo	In vitro	In vivo	In vitro
France	974	20	684	-
Netherlands	537	0	537	0
Germany	251	0	251	0
Total	1762	20	1472	0

Bovine Embryo Transfer

Country	N° of transferred embryos						Total	N° of exported embryos
	<i>In vivo</i>			<i>In vitro</i>				
	Fresh	Frozen domestic	Frozen foreign	Fresh	Frozen domestic	Frozen		
Austria	450	1003	3	0	0	0	1456	0
Belgium	1203	4368	1180	0	0	0	6751	90
Czech Republic	27	0	0	0	5	0	32	0
Denmark	2443	1269	-	-	-	-	3712	61
Estonia	0	7	24	0	0	0	31	0
Finland	942	1720	621	0	0	0	3283	8
France	18657	17249	1051	196	194	-	37347	562
Germany	19132	-	-	2765	-	-	21897	-
Hungary	220	315	101	-	-	-	636	15
Italy	6115	-	-	384	1074	-	7573	-
Ireland	834	947	-	450	-	-	2231	-
Kazakhstan	-	400	-	-	-	-	400	-
Lithuania	66	42	0	0	0	0	108	0
Luxembourg	450	950	-	-	30	-	1430	50
The Netherlands	5888	26522	-	4885	628	-	37923	1040
Norway	-	-	200	-	-	-	200	-
Poland	600	300	-	-	-	-	900	-
Portugal	56	32	31	10	34	-	163	-
Russian Federation	878	565	464	1781	483	-	4171	100
Slovenia	8	1	1	-	-	-	10	0
Spain	693	1428	141	959	479	10	3710	66
Sweden	164	231	514	0	0	0	909	0
Switzerland	720	1678	476	0	0	55	2929	151
Total	59546	59027	4807	11430	2927	65	137802	2143

Countries reporting no activity on bovine embryo transfers:
Bosnia Herzegovina, Croatia, Greece, Latvia, Moldova, Turkey

Embryo Activities in other Species

Country	Sheep			
	N° embryo produced	N° embryos transfers	Fresh	Frozen
Portugal	187 (IVP)			
Turkey	90	90	40	50
France				8 (goat)
Total	277	90	40	58

Country	Horse				
	N° collections	N° embryos produced	N° embryo transfers	Fresh	Frozen
France	606	365	365	365	
Poland	18	15	11	11	
Portugal			2		2
Switzerland	30				
Total (<i>In vivo</i>)	654	380	378	376	2
	N° OPU-ICSI sessions	N° oocytes collected	N° embryo produced	Fresh	Frozen
Italy (<i>In vitro</i>)	195	2050	141	8	75

Summary

The presented data are based on embryo transfer activities for breeding and commercial embryo production reported by 31 European countries (countries that have at least part of their country in Europe). The presented data include numbers on embryo production (MOET and OPU-IVP) and transfers for bovine and other species (sheep, swine, goat and horse). These data are included in the report of the International Embryo Transfer Association (IETS Data Retrieval Committee) on embryo transfer activities worldwide. Also, data concerning embryo sexing and genotyping is included in this report.

Embryo production

The total number of embryo collections from superovulated donors was 22,490. Of all collections, 80% were performed on dairy breeds, 15% on beef breeds and 5% on dual purpose breeds. This resulted in production of 138,418 transferable embryos, an increase compared to last year. The mean number of transferable embryos per collection was 6.15. The results of embryo collections on 2014 and previous years are shown in Figure 1.

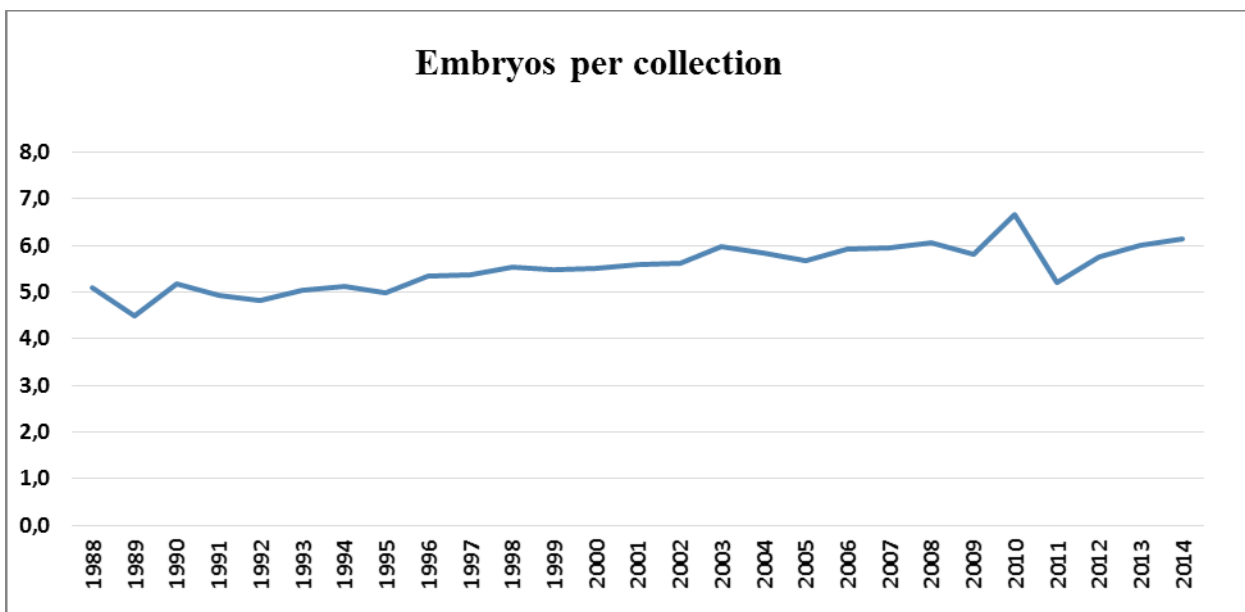
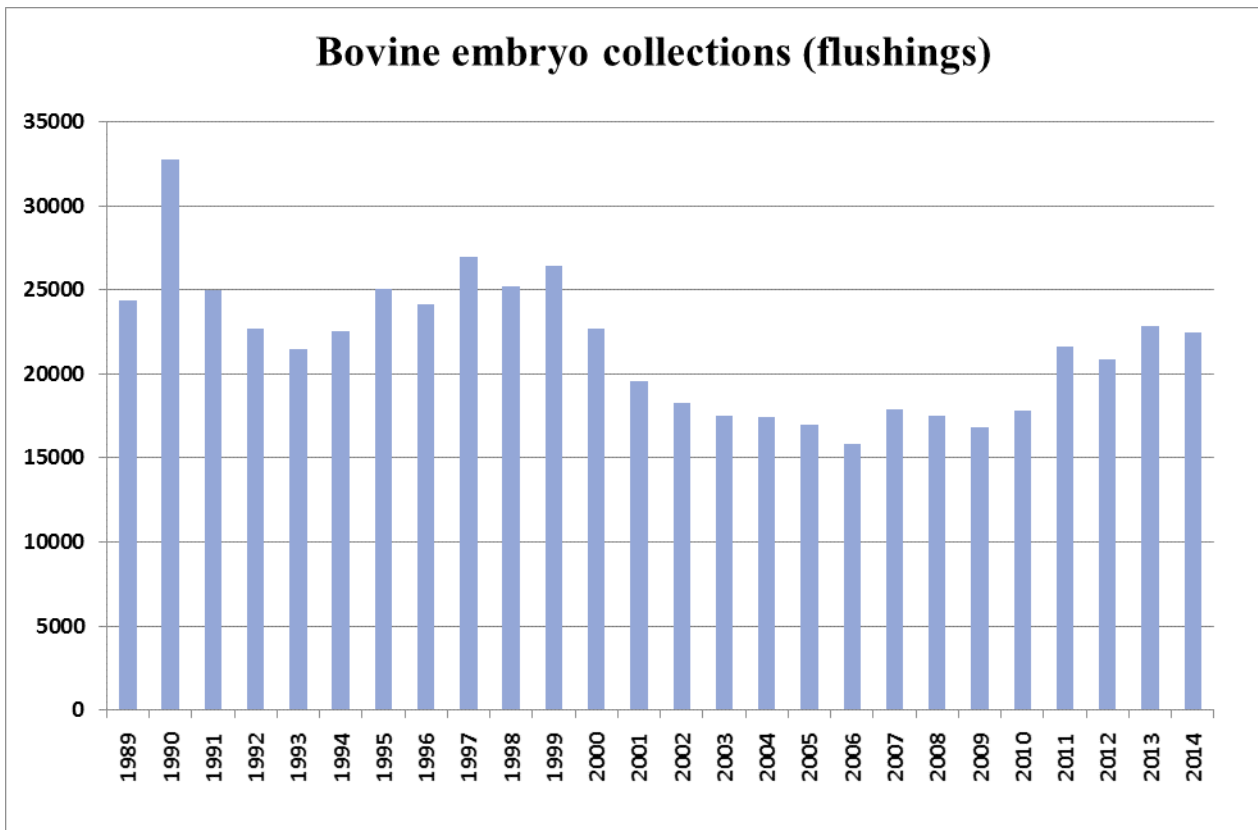


Fig. 1: In vivo embryo production in Europe (number of collections and number of embryos per collection).

Seven countries applied OPU on cattle for commercial reasons in 2014 (France, Germany, Italy, The Netherlands, Portugal, Russian Federation and Spain). The total number of OPU sessions was 9,710, a 29% increase compared to last year. This resulted in a production of 15,693 transferable embryos. The mean embryo production was 1.6 embryos per session. In addition to bovine OPU, there was one country, Italy, reporting activity in equine OPU, with 195 OPU-ICSI sessions. Bovine OPU-IVP results from 2014 and previous years are shown in Figure 2.

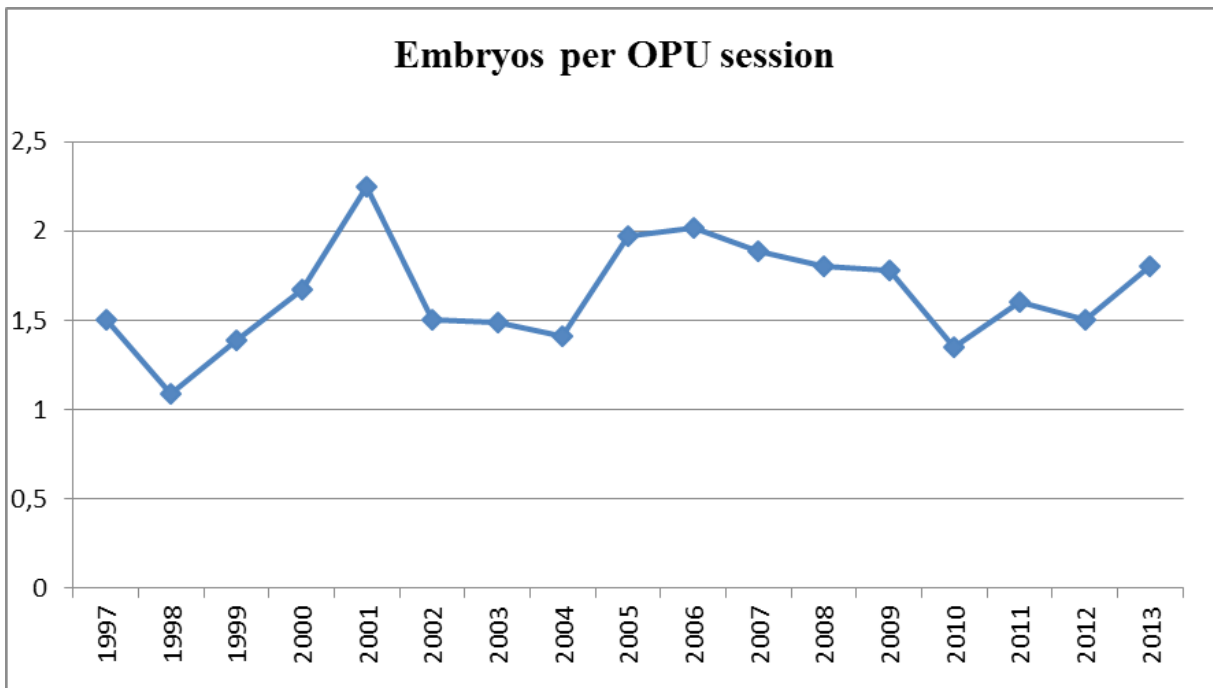
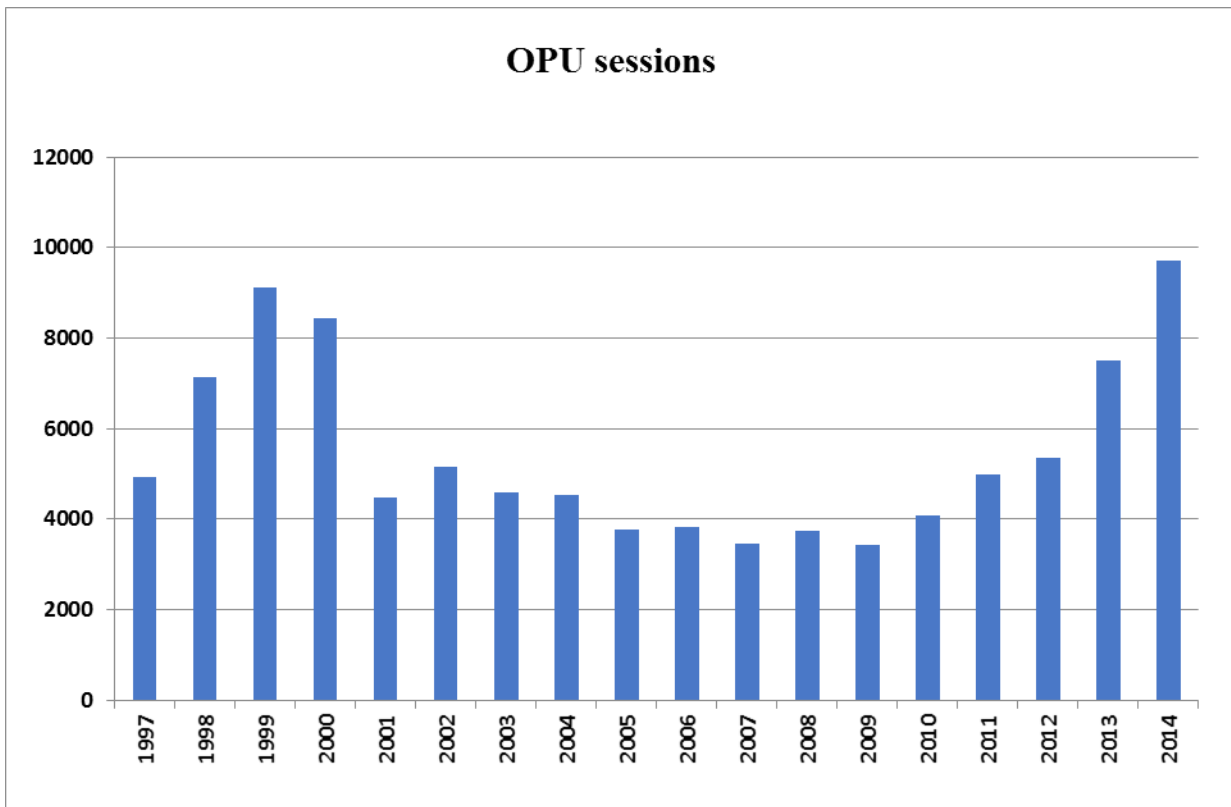


Fig. 2: In vitro embryo production in Europe (number of OPU sessions and number of embryos per session).

Embryo transfers

The number of embryos transferred amounts to 137,802, an increase compared to last year (Figure 3). The proportion of IVP embryos of all transfers was 10.5%. The proportion of frozen embryos was 52% and 21% for *in vivo* and *in vitro* embryos, respectively. More *in vivo* embryos were transferred fresh compared to previous years, as there was an increase of 10 percentage points in the proportion of fresh embryos.

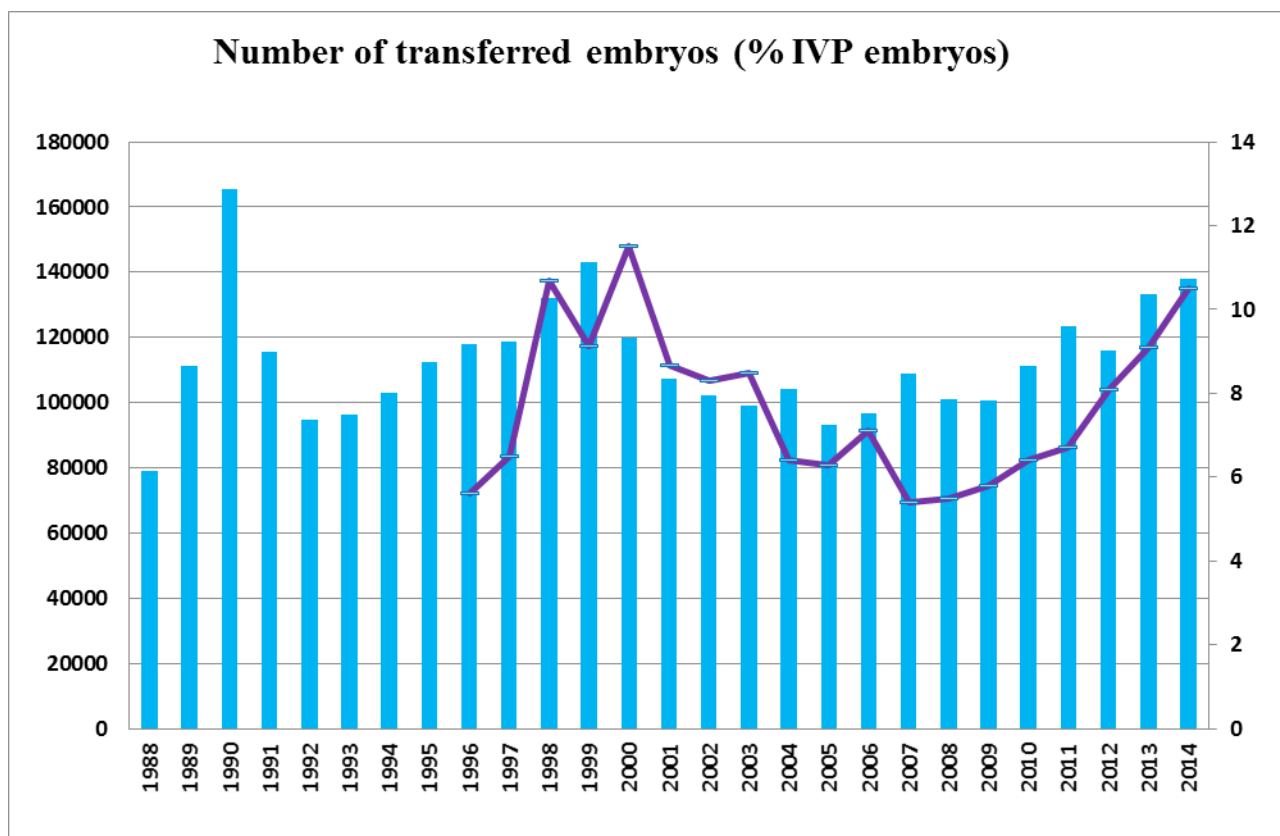


Fig.3:

Total number of embryos transferred in Europe with the percentage of IVC embryos.

The European countries that transferred more than 1000 embryos in 2014 are listed in Table 1 together with the number of transfers in 2013.

Table 1: The European countries with more than 1000 embryos transferred in 2014.

Country	Transfers 2014	Transfers 2013
The Netherlands	37,923	36,964
France	37,347	35,205
Germany	21,897	21,502
Italy	7,573	5,996
Belgium	6,751	4,876
Russian Federation	4,171	2,148
Denmark	3,712	3,581
Spain	3,710	3,209
Finland	3,283	2,973
Switzerland	2,929	2,210
Ireland	2,231	no data reported
Austria	1,456	998
Luxemburg	1,430	no data reported

Other data

In the yearly survey questions concerning the use of sexed semen in embryo production, as well as the number of genotyped embryos are included. Eleven countries reported the use of sexed semen in MOET. The use of sexed semen represents 4.3% of donors. Embryo sexing by biopsy was applied in three countries (France, Germany and The Netherlands). A total of 1782 embryos were sexed and from those 1472 embryos genotyped.

Other species

Data for embryo transfer activities in sheep, swine, goat and equine are shown in Figure 4. This year only 5 countries reported embryo activities in species other than bovine. Embryo activities were reported in sheep,

horses and swine. No activities were reported in goats. There are large fluctuations in activities over the years probably caused by incomplete data collection.

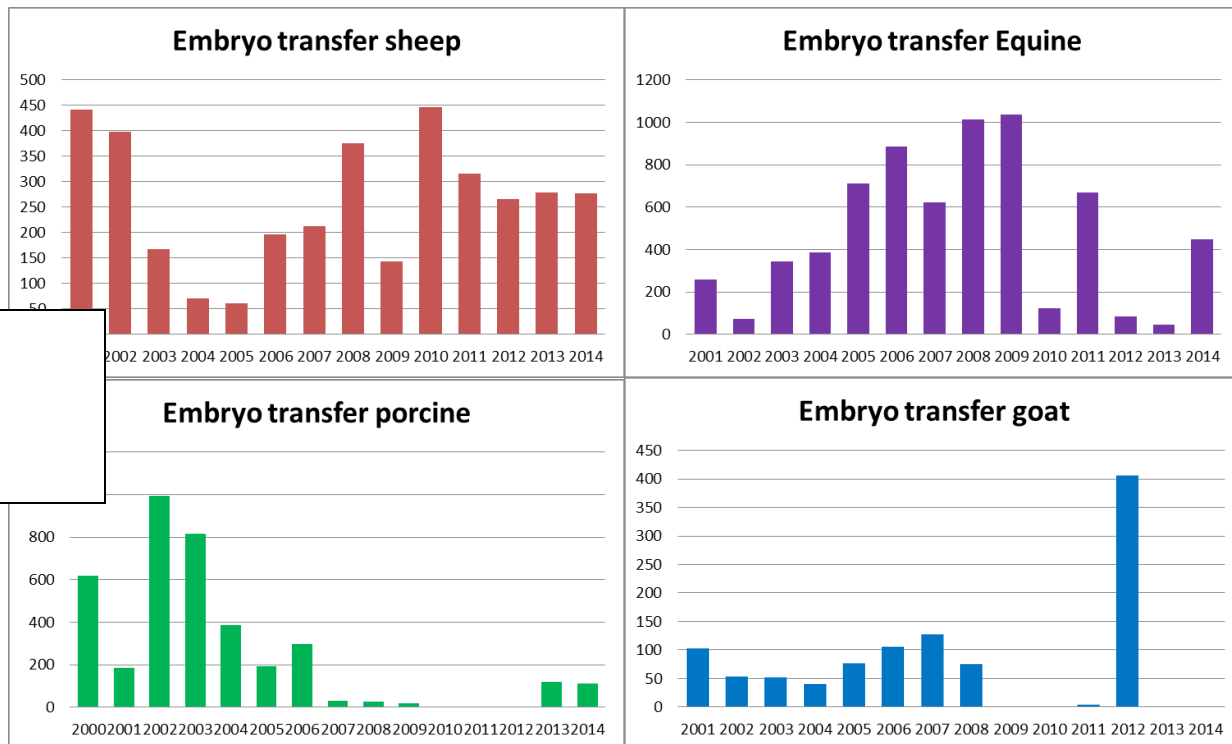


Fig. 4: Number of embryos of other species transferred in Europe.

Summary

- This year the data were collected in 31 countries, of which 27 reported activity.
- The number of embryos transferred in Europe has been increasing the last years both for in vivo as in vitro embryos.
- Number of OPU-sessions has been increasing markedly, as well as the proportion of IVP embryos of all embryo transfers.
- The activities in other species than bovine that are reported to AETE fluctuate a lot. It is very challenging to collect the data of other species. AETE members having contact information in their countries to persons performing ET in other species are encouraged to contact either their national data collector or AETE data collector to share their contact information.

Acknowledgements:

I would like to thank all participants who made the effort to collect the embryo transfer statistics for their country and helped AETE to make an overview of the activities in Europe. If you have any suggestions or questions concerning data collection please don't hesitate to contact AETE data collector (marja.mikkola@vikinggenetics.com / marja.mikkola@faba.fi).