

Commercial Embryo Transfer Activity in Europe 2017

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Data collection request was sent to 38 countries in February 2018. Among these, 32 countries replied (82%). Four countries reported having no ET-activity in any species in 2017.

Regardless of the response rate of 82% among all countries, there is a large variation in the response rate from ET-teams within a country. Personal communication with several national data collectors indicates that in majority of countries a few teams are not included in the data, leading to a relatively diminutive underestimation of activity. Regarding many other species than bovine, there is continuously a big gap between the actual and reported activity.

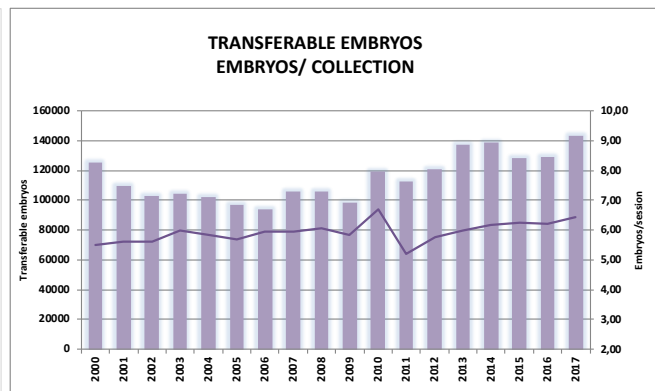
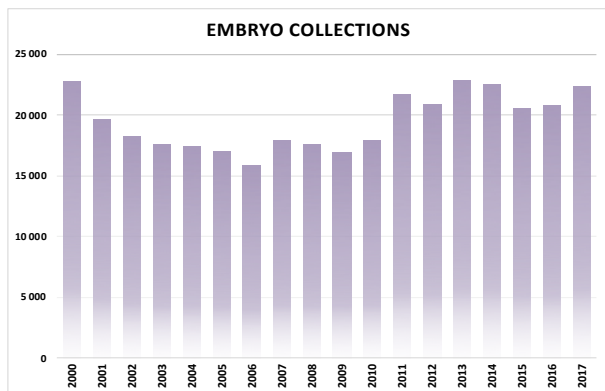
National data collectors

Country	Collector
Austria	Friedrich Führer
Belgium	Peter Vercauteren, Isabelle Donnay
Bosnia Herzegovina	Teodor Markovic
Croatia	Mario Matkovic
Czech Republic	Pavel Bucek
Denmark	Henrik Callesen
Estonia	Jevgeni Kurykin
Finland	Seija Vahtiala
France	Serge Lacaze
Germany	Hubert Cramer
Greece	Foteini Samartzi
Hungary	Istvan Pentek
Ireland	Patrick Lonergan
Israel	Amir Shifman, Yoel Zeron
Italy	Giovanna Lazzari
Latvia	Vita Antane
Lithuania	Rasa Nainiene
Luxembourg	Marianne Vaessen
Macedonia	Toni Dovenski
The Netherlands	Helga Flapper, Hilde Aardema
Norway	Eiliv Kummen
Poland	Jędrzej Jaśkowski
Portugal	João Nestor Chagas e Silva
Russian Federation	Denis Knurov, Viktor Madison
Serbia	Aleksandar Milovanovic
Slovakia	Jozef Bires, Dalibor Polak
Slovenia	Janko Mrkun
Spain	Daniel Martinez Bello
Sweden	Renée Båge
Switzerland	Rainer Saner
Turkey	Ebru Emsen
Ukraine	Viktor Madison
United Kingdom	Roger Sturmey, Brian Graham

Bovine *In vivo* embryo production

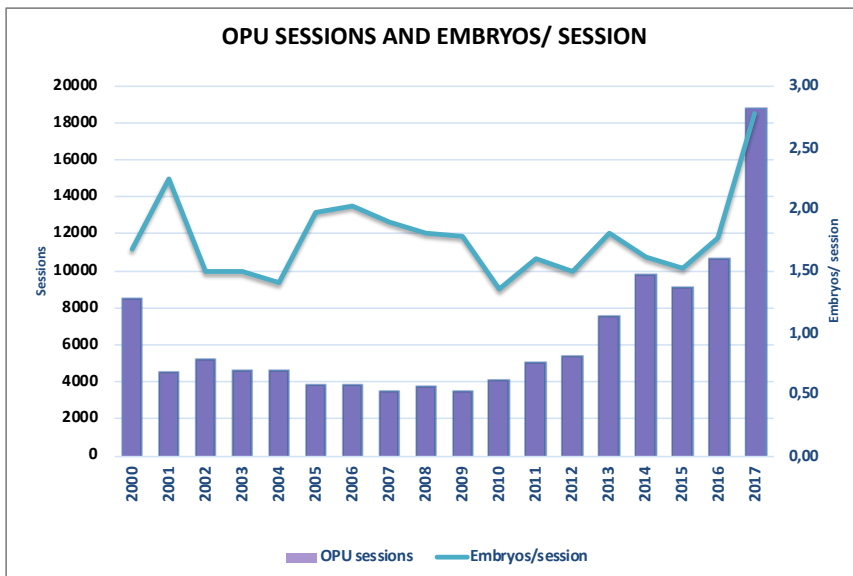
Country	Collections	Viable embryos	Embryos/ collection	Dairy breeds (% collections)	Sexed semen (% collections)
Austria	271	2014	7,4	93,0 %	3,7 %
Belgium	1160	5973	5,1	12,5 %	0,3 %
Bosnia and Herzegovina	0	0			
Croatia	0	0			
Denmark	759	4785	6,3	92,4 %	0,0 %
Estonia	0	0			
Finland	310	1949	6,3	99,4 %	2,9 %
France	6729	35277	5,2	79,7 %	14,0 %
Germany	3412	22882	6,7	88,8 %	0,0 %
Greece	0	0			
Hungary	60	371	6,2	30,0 %	28,3 %
Ireland	785	4328	5,5	100,0 %	0,0 %
Israel	60	212	3,5	100,0 %	3,3 %
Italy	2500	19883	8,0	94,0 %	40,0 %
Latvia	6	0	0,0	100,0 %	0,0 %
Lithuania	4	23	5,8	100,0 %	0,0 %
Luxembourg	212	1151	5,4	95,3 %	10,8 %
Macedonia	0	0			
Netherlands	2493	21910	8,8	100,0 %	0,0 %
Norway	60	370	6,2	61,7 %	0,0 %
Poland	226	1177	5,2	93,8 %	42,0 %
Portugal	102	510	5,0	69,6 %	26,5 %
Russian Federation	1855	12832	6,9	30,8 %	26,4 %
Serbia	6	25	4,2	100,0 %	0,0 %
Slovakia	0	0			
Slovenia	11	33	3,0	100,0 %	0,0 %
Spain	551	2930	5,3	67,0 %	45,0 %
Sweden	130	564	4,3	97,7 %	0,0 %
Switzerland	543	3911	7,2	94,5 %	49,2 %
Ukraine	10	21	2,1	100,0 %	0,0 %
United Kingdom*	61	327	5,4	11,5 %	4,9 %
Total	22316	143458	6,4	79,1 %	14,1 %

* Data missing, not representative



Bovine *In vitro* embryo production (OPU-IVP)

Country	Sessions	Oocytes	Oocytes/ Session	Embryos	Embryos/ Session	Stimulated sessions (%)	Sexed semen (%)	Dairy breeds (%)
Finland	455	3748	8,24	1211	2,66	77,4 %	17,8 %	100,0 %
France	691	6171	8,93	1756	2,54	99,0 %	18,4 %	95,7 %
Germany	1020	13880	13,61	1794	1,76	55,2 %	0,0 %	98,3 %
Italy	482	4819	10,00	818	1,70	21,6 %	40,2 %	100,0 %
Netherlands	7345	83421	11,36	16695	2,27	80,0 %	0,0 %	100,0 %
Poland	14	89	6,36	34	2,43	0,0 %	78,6 %	100,0 %
Russian Federation	7758	87120	11,23	26762	3,45	0,0 %	73,6 %	42,2 %
Spain	839	11122	13,26	2746	3,27	12,0 %	65,8 %	86,1 %
Switzerland	41	312	7,61	81	1,98	0,0 %	56,1 %	100,0 %
United Kingdom	39	415	10,64	74	1,90	0,0 %	7,7 %	7,7 %
Total	18684	211097	11,30	51971	2,78	49,0 %	35,8 %	74,9 %



Bovine *In vitro* embryo production - abattoir

Country	Donors	Oocytes	Embryos	Embryos/ Donor
Italy	16	566	107	6,7
Netherlands	21	1041	177	8,4
Russian Federation	34	654	105	3,1
Spain	235	1912	480	2,0
Switzerland	3	103	39	13,0
Total	309	4276	908	2,9

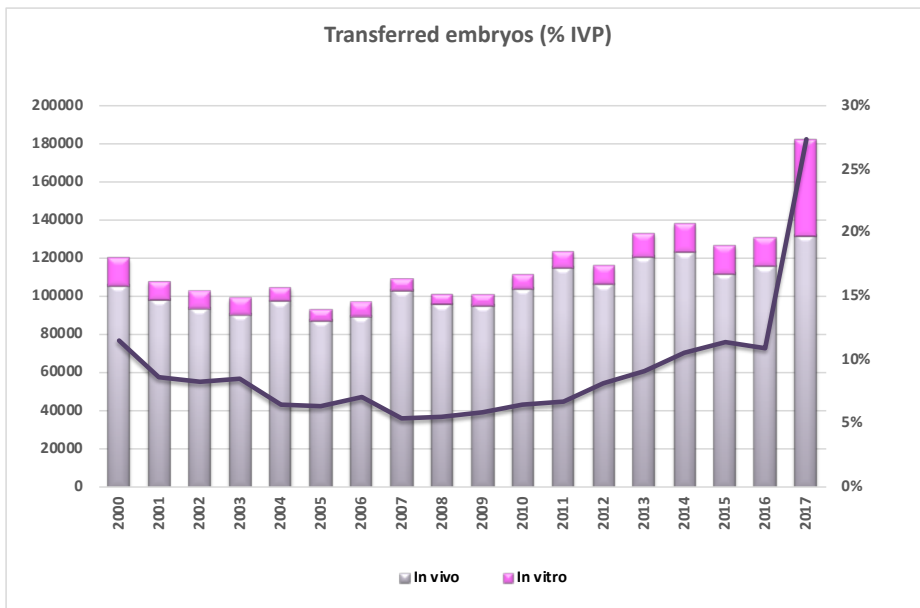
Bovine *In vivo* embryo transfer

The reported number of transferred embryos was highest in the AETE data collection history, since 1998, predominantly due to the increase in IVP embryo transfers.

Country	Dairy breeds			Beef breeds			Non-separated breeds			Total transfers
	Fresh	Frozen domestic	Frozen foreign	Fresh	Frozen domestic	Frozen foreign	Fresh	Frozen domestic	Frozen foreign	
Austria	640	824	77	12	95	27	0	0	0	1675
Belgium	173	493	1616	995	3017	34	0	0	0	6328
Bosnia and Herzegovina	0	0	0	0	0	0	0	0	0	0
Croatia	0	0	0	0	0	0	0	0	0	0
Denmark	2494	1253	0	129	124	0	0	0	0	4000
Estonia	0	0	0	0	0	0	0	0	0	0
Finland	722	1484	212	9	1	33	0	0	0	2461
France	14216	12668	1615	2630	4548	289	56	0	0	36022
Germany	8047	11078	0	717	1351	0	0	0	0	21193
Greece	0	0	2	0	0	0	0	0	0	2
Hungary	60	58	0	29	129	0	0	0	0	276
Ireland	1698	2155	0	0	0	0	0	0	0	3853
Israel	192	8	0	0	0	0	0	0	0	200
Italy	7400	0	0	0	0	0	0	0	0	7400
Latvia	0	0	0	0	0	0	0	0	0	0
Lithuania	0	0	0	0	0	0	0	0	0	0
Luxembourg	280	800	35	20	70	0	0	0	0	1205
Macedonia	0	0	0	0	0	0	0	0	0	0
Netherlands	6303	17867	0	0	0	0	0	0	0	24170
Norway	35	142	0	25	28	113	0	0	0	343
Poland	760	288	123	20	3	0	0	0	0	1194
Portugal	92	339	0	31	32	13	0	0	0	507
Russian Federation	823	1484	24	45	11334	0	0	0	0	13710
Serbia	10	15	0	0	0	0	0	0	0	25
Slovakia	0	0	0	0	0	0	0	0	0	0
Slovenia	13	5	0	0	0	8	0	0	0	26
Spain	453	485	59	403	147	21	664	471	56	2759
Sweden	205	412	0	2	0	0	0	0	0	619
Switzerland	1012	2152	622	32	69	32	0	0	0	3919
Ukraine	21	0	0	0	0	0	0	0	0	21
United Kingdom	21	23	8	57	116	37	0	0	0	262
Total	45670	54033	4393	5156	21064	607	720	471	56	132170

Bovine *In vitro* embryo transfer

Country	OPU			Abattoir			Total transfers
	Fresh	Frozen domestic	Frozen foreign	Fresh	Frozen domestic	Frozen foreign	
Finland	49	798	0	0	0	0	847
France	815	329	49	19	3	0	1215
Germany	1508	174	0	0	0	0	1682
Hungary	0	0	105	0	0	0	105
Italy	212	503	0	0	42	0	757
Netherlands	10196	4731	0	63	114	0	15104
Poland	16	7	0	0	0	0	23
Russian Federation	20302	7658	0	0	0	0	27960
Spain	1407	448	12	28	20	3	1918
Switzerland	2	7	117	0	0	0	126
United Kingdom	0	15	0	0	0	0	15
Total	34507	14670	283	110	179	3	49752



Bovine embryo technologies

Country	Sexed embryos		Genotyped embryos	
	In vivo	In vitro	In vivo	In vitro
France	2491	0	2388	0
Germany	768	73	367	19
Netherlands	0	0	164	1080
Total	3259	503	2919	1099

Embryo exports

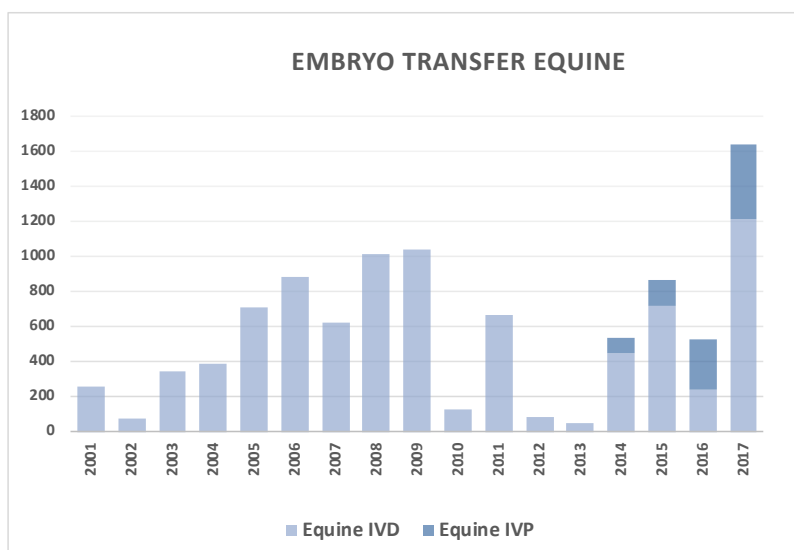
Country	Embryos exported		
	Bovine, dairy	Bovine, beef	Bovine, non-separated
Austria	274	5	0
Belgium	35	58	0
Denmark	51	0	0
Finland	53	0	0
France	250	304	0
Luxembourg	50	0	0
Netherlands	1701	0	0
Norway	0	40	0
Spain	43	0	160
Switzerland	97	0	0
United Kingdom	0	119	0
Grand Total	2554	526	160

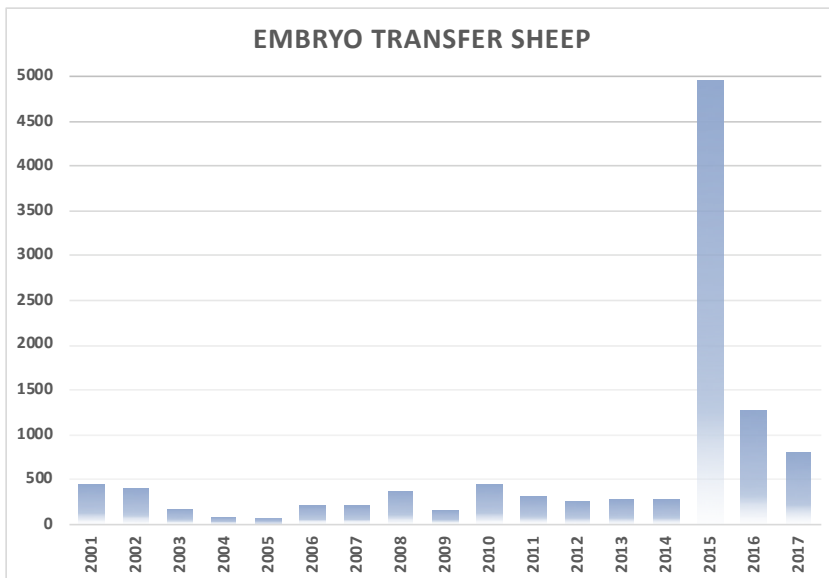
Embryo production and transfer in other species – *In vivo*

Country	Embryo collection		Embryo transfer		
	Collections	Viable embryos	Fresh embryos	Frozen domestic	Frozen foreign
SHEEP					
France	10	33	0	0	0
Hungary	5	39	0	0	45
Sweden	20	67	0	67	365
United Kingdom	557	2717	217	116	0
Total	592	2856	217	183	410
GOAT					
France	9	76	0	0	0
Total	9	76	0	0	0
HORSE					
Finland	4	1	1	0	0
France	1476	776	776	0	0
Italy	289	197	197	0	0
Netherlands	284	164	164	0	0
Poland	7	7	7	0	0
Russian Federation	3	2	2	4	0
Spain	15	12	12	0	0
Sweden	23	15	15	0	0
Switzerland	72	37	30	2	0
Total	2173	1211	1204	6	0
OTHER					
Slovakia	10	20	0	0	0
Total	10	20	0	0	0

Embryo production and transfer in other species – *In vitro*

Country	Embryo collection			Embryo transfer	
	OPU sessions	Oocytes	Embryos	Fresh embryos	Frozen embryos
BUFFALO					
Italy	3	66	26	0	0
Total	3	66	26	0	0
HORSE					
Italy	934	10866	885	82	203
Netherlands	213	2807	241	0	140
Switzerland	56	215	16	0	3
Total	1203	13888	1142	83	346





In 2017, no activity was reported in swine ET.

Conclusions

- There was a slight increase in the production of bovine *In vivo* embryos (highest number reported since 1999).
- There was a notable increase in the number of OPU sessions (bovine) reported, also higher efficacy of OPU (2.8 embryos/ session compared to 1.6 in 2016). These resulted in the highest number of embryos produced during the history of AETE data collection. A production of 143,458 *In vivo* embryos and 52,879 *In vitro* embryos was reported, resulting in total of 196,337 viable embryos.
- Activity in embryo technologies, genotyping of embryos, continued to increase. Also IVP embryos were genotyped.

Acknowledgements

Those wishing to use tables, can contact the author for a more practical format in an excel-sheet.

I would like to acknowledge all national data collectors, and also persons not mentioned on the list of collectors, but giving their contribution to achieve the data behind the scenes. I also want to express my gratitude and acknowledge all the practitioners and ET-teams, who provided their data.