

STATISTICS COMMITTEE REPORT - AETA 2018

Survey data is only as good as the quality and integrity of the data submitted by people. Thank you for taking the time to submit your data.

Unfortunately, I will not be able to attend this year's meeting due to the birth of our precious Alice in the end of May. If you have any questions and/or suggestions for next year's survey please contact me at any time. Special thanks for Michael Wehrman for his guidance.

Sincerely,

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2018 SURVEY SUMMARY (2017 DATA)

The submitted data from 238 embryo practitioners, 138 ETBs (Embryo Transfer Businesses), 119 AETA certified, is summarized below. This year, non AETA members were allowed to submit data. Part of the increase in the numbers from last year are a consequence of that.

- Embryo transfer work is the main business of 68 ETBs (considered >80% ET work);
- 137 ETBs transferred embryos (20 only *in vivo*, 5 only *in vitro* and 112 both);
- 126 ETBs flushed cows;
- 32 ETBs performed OPUs;
- 13 IVF labs reported data (fertilized oocytes and cultured the embryos *in vitro*);
- 16 ETBs produced other species embryos;

Table 1: 2017 BOVINE EMBRYO TRANSFERS

		<i>IN VIVO</i>			<i>IN VITRO</i>			<i>TOTAL</i>		
		<i>FRESH</i>	<i>FROZEN</i>	<i>TOTAL</i>	<i>FRESH</i>	<i>FROZEN</i>	<i>TOTAL</i>	<i>FRESH</i>	<i>FROZEN</i>	<i>TOTAL</i>
DAIRY	TOTAL	23,415	21,307	44,722	119,696	43,703	163,399	143,111	65,010	208,121
	%	52%	48%	21%	73%	27%	79%	69%	31%	52%
BEEF	TOTAL	45,974	79,736	125,710	33,122	34,897	68,019	79,096	114,633	193,729
	%	37%	63%	65%	49%	51%	35%	41%	59%	48%
TOTAL	TOTAL	69,389	101,043	170,432	152,818	78,600	231,418	222,207	179,643	401,850
	%	41%	59%	42%	66%	34%	58%	55%	45%	

Table 2: 2017 BOVINE IN VIVO EMBRYO PRODUCTION (SUPERVOVULATION/FLUSH)

		<i>COLLECTIONS</i>	<i>TOTAL OVA</i>	<i>VIABLE</i>	<i>FRESH</i>	<i>FROZEN</i>
DAIRY	TOTAL	10,063	99,076	57,708	23,404	34,304
	AVERAGE		9.8	5.7		
	%			58%	41%	59%
BEEF	TOTAL	24,252	307,511	166,573	45,092	121,481
	AVERAGE		12.7	6.9		
	%			54%	27%	73%
TOTAL	TOTAL	34,315	406,588	224,281	68,496	155,785
	AVERAGE		11.8	6.5		
	%			55%	31%	69%

Table 3: 2017 Bovine In Vitro Embryo Production (IVF)

<i>All ETBs that performed OPU</i>	DAIRY			BEEF			TOTAL		
	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>
Total OPUs	47,018	36,724	83,742	3,392	20,816	24,208	50,410	57,540	107,949
Total Oocytes Recovered	731,350	617,509	1,348,859	60,442	463,424	523,866	791,791	1,080,933	1,872,724
Oocytes per OPU	15.6	16.8	16.1	17.8	22.3	21.6	15.7	18.8	17.3
<i>ETBs with IVF labs only</i>	DAIRY			BEEF			TOTAL		
	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>	<i>WITHOUT FSH</i>	<i>WITH FSH</i>	<i>TOTAL</i>
Total OPUs	46,847	32,640	79,487	3,302	20,138	23,440	50,149	52,778	102,926
Total Oocytes Recovered	729,422	541,118	1,270,540	58,812	452,620	511,432	788,233	993,738	1,781,971
Oocytes per OPU	15.6	16.6	16.0	17.8	22.5	21.8	15.7	18.8	17.3
Fertilized Oocytes	606,178	546,316	1,152,494	51,587	434,437	486,024	657,765	980,753	1,638,518
Fertilized Oocytes per OPU	12.9	16.7	14.5	15.6	21.6	20.7	13.1	18.6	15.9
Total Viable Embryos	107,330	170,980	278,310	16,022	126,805	142,827	123,352	297,785	421,137
Viable Embryos per OPU	2.3	5.2	3.5	4.9	6.3	6.1	2.5	5.6	4.1
% Viable Embryos (Viable/Fertilized)	18%	31%	24%	31%	29%	29%	19%	30%	26%
Total Frozen (in the production lab)	28,743	64,623	93,366	10,109	78,057	88,166	38,852	142,680	181,532
% Frozen	27%	38%	34%	63%	62%	62%	31%	48%	43%
Total Transferred Fresh or Discarded	78,587	106,357	184,944	5,913	48,748	54,661	84,500	155,105	239,605
% Transferred Fresh or Discarded	73%	62%	66%	37%	38%	38%	69%	52%	57%
<i>Commercial Abattoir Embryo Production</i>	DAIRY			BEEF			TOTAL		
Total Oocytes Recovered	19,312			2,723			22,035		
Total Viable Embryos	6,776			965			7,741		
% Viable Embryos	35%			35%			35%		

The data for this table was divided in 2 categories: companies that predominantly use FSH for OPU cows (WITH FSH) or don't (WITHOUT FSH).

Viable embryos – Day 6 embryos sent by the lab to a practitioner (not necessarily will be transferred or frozen on day 7) and/or Day 7 embryos transferred fresh, frozen or discarded.

2017 TOTAL EMBRYO TRANSFERS BY STATE

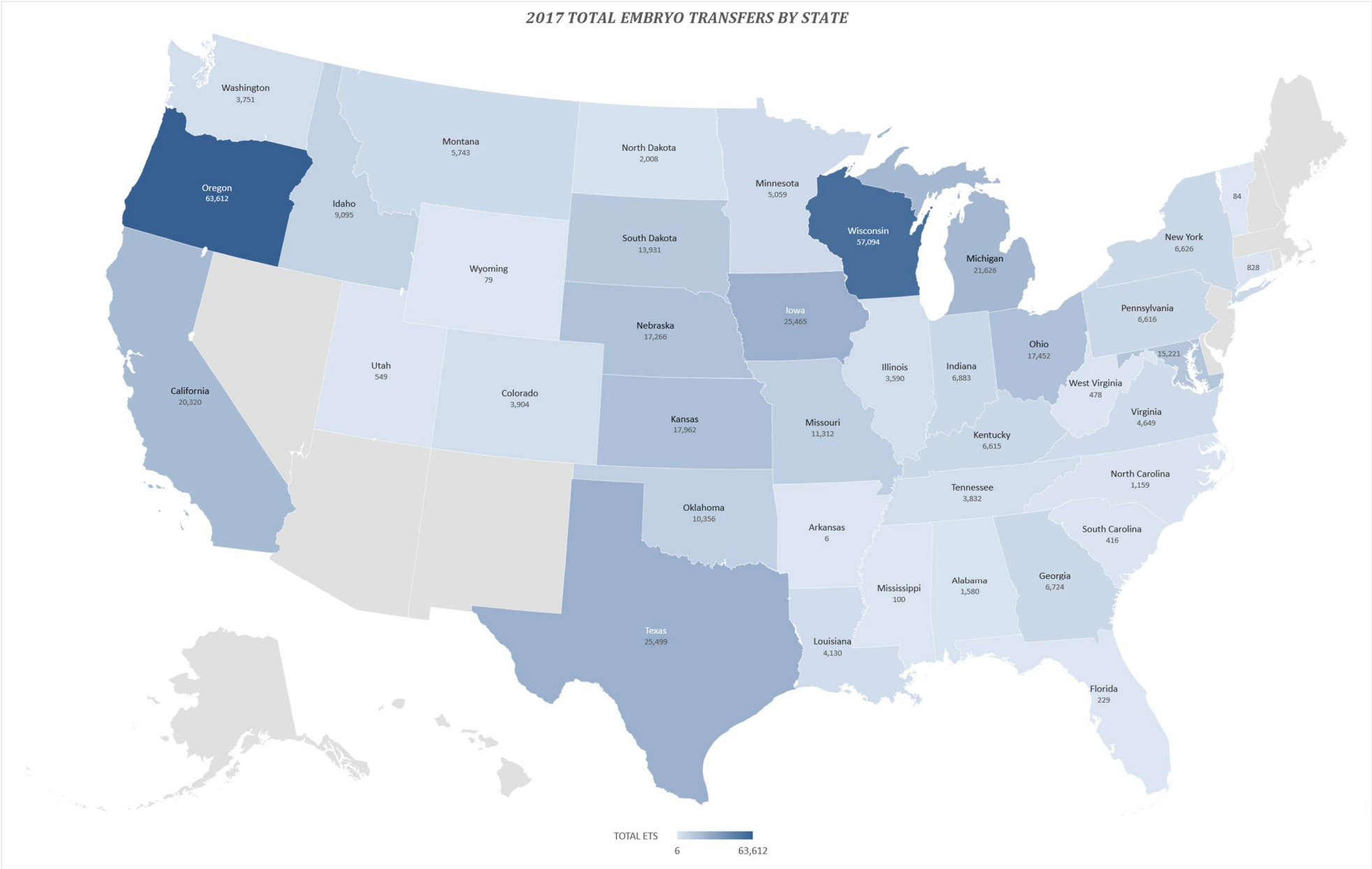


Table 4: 2017 BOVINE EMBRYO TRANSFERS, FLUSHES, OPUS AND ETBS BY STATE

STATE	ETs		FLUSHES		OPUS		ETBS
	TOTAL	%	TOTAL	%	TOTAL	%	TOTAL
Alabama	1,580	0.39%	248	0.72%	5	0.00%	3
Arkansas	6	0.00%	2	0.00%	0	0.00%	1
California	20,320	5.06%	1,171	3.41%	2,008	1.86%	8
Colorado	3,904	0.97%	764	2.23%	0	0.00%	2
Connecticut	828	0.21%	97	0.28%	254	0.24%	2
Florida	229	0.06%	0	0.00%	0	0.00%	1
Georgia	6,724	1.67%	1,176	3.43%	32	0.03%	4
Idaho	9,095	2.26%	401	1.17%	3,021	2.80%	5
Illinois	3,590	0.89%	347	1.01%	125	0.12%	8
Indiana	6,883	1.71%	908	2.65%	1,377	1.28%	8
Iowa	25,465	6.34%	2,161	6.30%	11,811	10.94%	11
Kansas	17,962	4.47%	2,864	8.35%	77	0.07%	4
Kentucky	6,615	1.65%	1,087	3.17%	90	0.08%	5
Louisiana	4,130	1.03%	323	0.94%	0	0.00%	1
Maryland	15,221	3.79%	1,070	3.12%	9,767	9.05%	5
Michigan	21,626	5.38%	562	1.64%	7,403	6.86%	3
Minnesota	5,059	1.26%	1,044	3.04%	1,074	0.99%	8
Mississippi	100	0.02%	0	0.00%	0	0.00%	1
Missouri	11,312	2.81%	879	2.56%	3,922	3.63%	5
Montana	5,743	1.43%	1,257	3.66%	0	0.00%	3
Nebraska	17,266	4.30%	1,987	5.79%	0	0.00%	5
New York	6,626	1.65%	775	2.26%	0	0.00%	8
North Carolina	1,159	0.29%	180	0.52%	10	0.01%	3
North Dakota	2,008	0.50%	221	0.64%	0	0.00%	3
Ohio	17,452	4.34%	1,206	3.52%	1,172	1.09%	10
Oklahoma	10,356	2.58%	1,610	4.69%	2,013	1.86%	9
Oregon	63,612	15.83%	18	0.05%	29,700	27.51%	2
Pennsylvania	6,616	1.65%	933	2.72%	825	0.76%	12
South Carolina	416	0.10%	61	0.18%	2	0.00%	3
South Dakota	13,931	3.47%	812	2.37%	4,706	4.36%	5
Tennessee	3,832	0.95%	625	1.82%	0	0.00%	3
Texas	25,499	6.35%	3,910	11.39%	10,973	10.17%	13
Utah	549	0.14%	37	0.11%	73	0.07%	2
Vermont	84	0.02%	18	0.05%	0	0.00%	1
Virginia	4,649	1.16%	569	1.66%	84	0.08%	7
Washington	3,751	0.93%	358	1.04%	1,163	1.08%	4
West Virginia	478	0.12%	71	0.21%	6	0.01%	2
Wisconsin	57,094	14.21%	4,553	13.27%	16,258	15.06%	28
Wyoming	79	0.02%	9	0.03%	0	0.00%	1
TOTAL	401,850		34,315		107,949		209

The 3 highest numbers per State in each category are highlighted.

Embryo Transfer, Flush and OPU total numbers were calculated based on the % of work per State informed by the ETBs. For the next year's survey we can divide in Dairy and Beef if the ETBs inform the percentages separated by category.

Table 5: 2017 EMBRYOS EXPORTED BY BREED

BREED	IN VIVO		IN VITRO		TOTAL
	DAIRY	BEEF	DAIRY	BEEF	
Akaushi		342			342
Angus		918		855	1,773
Ayrshire	40		21		61
Brangus		10			10
Brown Swiss	54		18		72
Charolais		46		14	60
Crossbred		170		79	249
Fleckvieh		180			180
Girlando			50		50
Guernsey	26				26
Hereford		25		2	27
Holstein	6,909		2,442		9,351
Jersey	90				90
Limousin		8		23	31
Red Angus		51		289	340
Red Brangus		12			12
Senepol		51			51
Simmental		910		195	1,105
South Devon		8		9	17
Texas Longhorn		92			92
Wagyu		1,090		18	1,108
TOTAL	7,119	3,913	2,531	1,484	15,047

The 3 highest numbers in each category are highlighted.

Table 6: 2017 EMBRYOS EXPORTED BY COUNTRY

COUNTRY	IN VIVO		IN VITRO		TOTAL
	DAIRY	BEEF	DAIRY	BEEF	
Argentina		84			84
Australia	537	364			901
Belize		12	50		62
Brazil	65	359			424
Canada	104	183	145	1,314	1,746
China	1,305	1,024			2,329
Colombia	4				4
Costa Rica		95			95
Dominican Republic	108				108
Ecuador	97	402	6		505
European Union	2,433	733	1,146	170	4,482
India			83		83
Japan	1,981				1,981
Kazakhstan	18	35	1,000		1,053
Korea	55				55
Mexico	15	44			59
New Zealand	19	16			35
Pakistan	208				208
Russia	102	5			107
South Africa		462			462
Switzerland	39		101		140
Taiwan	6				6
Thailand	23				23
Uruguay		95			95
TOTAL	7,119	3,913	2,531	1,484	15,047

The embryos exported to Russia are included in Europe (102 Dairy and 5 Beef – *in vivo*). The European Union combines: Austria, Czech Republic, France, Germany, Ireland, Italy, Netherlands, Poland, Portugal, Sweden and United Kingdom. It was not possible to divide by country since a few members didn't report which country of the EU the embryos were sent to.

Table 7: 2017 EMBRYOS EXPORTED BY CONTINENT

CONTINENT	IN VIVO		IN VITRO		TOTAL	
	DAIRY	BEEF	DAIRY	BEEF	TOTAL	%
AFRICA		462			462	3.1%
ASIA	3,578	1,024	83		4,685	31.1%
AUSTRALIA	556	380			936	6.2%
EUROPE	2,592	773	2,247	170	5,782	38.4%
NORTH AMERICA	227	334	195	1,314	2,070	13.8%
SOUTH AMERICA	166	940	6		1,112	7.4%
TOTAL	7,119	3,913	2,531	1,484	15,047	

The highest number in each category is highlighted.

Table 8: 2017 ET OF IMPORTED EMBRYOS

COUNTRY	BREED	TYPE	EMBRYOS
CANADA	Holstein	<i>in vivo</i>	33
CANADA	Guernsey	<i>in vivo</i>	2
UNITED KINGDOM	Shetland	<i>in vivo</i>	6
AUSTRALIA	Wagyu	<i>in vitro</i>	6
TOTAL			47

TABLE 9: 2017 Other Species Embryo production

Species	Collection data						Transfer Data			
	Collections	Total Ova	Viable	Ave Ova	Ave Viable	% Viable	Frozen	Fresh	Frozen	Total
Equine	60	45	39	0.8	0.7	86.7%	0	39	0	39
Ovine	292	2,222	1,567	7.6	5.4	70.5%	1,111	445	10	455
Caprine	413	5,397	3,015	13.1	7.3	55.9%	493	2,438	191	2629
Porcine	2	36	16	18.0	8.0	44.4%	0	43	0	43
Cervidae	17	75	61	4.4	3.6	81.3%	41	20	0	20

Porcine fresh transfers was total number of recipients transferred to. These were Day 1 oocytes, number in the hundreds for each transfer.

In vitro embryo production in small ruminants was reported by one ETB:

Caprine - 201 oocytes, 61 viable embryos (30%), 61 frozen embryos and

Ovine - 195 oocytes, 66 viable embryos (33%), 11 frozen embryos, 55 fresh embryos.

There is the need to contact other species associations to gather more data.

Four ETBs reported to have manipulated 279 *in vivo* embryos (56 biopsied for sexing, 19 biopsied for genomics and 204 bisected).