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GEDIS® AI technology vs. Conventional AI
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Introduction and Objective

In today's swine industry sow production facilities must strive to reduce production costs and improve efficiencies to remain competitive. Maximizing sow facility throughput and breeding efficiency can reduce overall production costs and enhance profitability.

The following is a summary of field trials conducted at multiple commercial breeding and farrowing facilities in the United States. This study compares the GEDIS® "All-In-One" AI catheter manufactured by Genes Diffusion with existing conventional AI methods commonly used in sow breeding. Farrowing, rate, total born and labor efficiencies were examined to determine the effectiveness of this technology in commercial production.

GEDIS® Catheter – Description and Characteristics

The GEDIS® AI catheter is a complete insemination unit with the extended semen packaged along the length of the catheter shaft in a collapsible membrane. The semen is held in the packaging by a heat sensitive "gel" plug. The catheter tip is inserted into the cervix and the shaft of the catheter along with the semen is placed in the vaginal vault. After insertion into the cervix the sow's body temperature warms the "gel" plug and semen. The "gel" plug is designed to dissolve at 100°F, resulting in "auto-insemination". The catheter is totally contained in the sow during the insemination process and there is nothing for the technician to handle. This allows the technician to supervise the breeding of multiple sows simultaneously.

GEDIS® AI catheter Design Characteristics: "All-In-One Design" that is Ready-To-Use and Easy-To-Use. Each catheter is individually sealed – Improving sanitation and optimizing hygiene. The large, soft pliable tip is designed to firmly seal the cervix – Improving semen retention. Semen is pre-warmed by the sow's body temperature prior to insemination – which also improves semen retention.

Trial Protocol

The following protocol guidelines were established for these trials:

Semen Collection, Processing and Packaging-

The semen for all trials was collected, processed and packaged at one commercial boar stud in the Midwest. Single boar ejaculates were collected and processed according to the boar studs SOP. Semen was processed to contain between 2.5 – 3.0 billion fertile cells per dose. Once processed, each boar ejaculate was split. Half was packaged using the GEDIS® catheter, the other half was packaged in cochette bags. Each delivery of semen was equally divided between GEDIS® and cochette bag packaging. All semen was stored at the individual farms in semen cooler and rotated twice daily. All AI technicians received on farm individual instruction on the use of the GEDIS® catheter. Each farm utilized the catheter for 2 weeks prior to the start of each trial to allow the AI technicians time to practice and become familiar with the GEDIS® catheter.

Female Selection and Insemination-

Females received all inseminations using either the GEDIS® catheter, or inseminations with foam tip catheter and a cochette semen package system. Females were monitored throughout the gestation cycle for changes in pregnancy status. All farms in the trial routinely utilize a real-time ultrasound for pregnancy detection.

Data Collection and Analysis-

Data from each farm was collected using the farms record keeping system. Farrowing data was recorded for all sows. Data was analyzed by incorporating a fertility index. The index was calculated as follows:
(Weekly Farrowing Rate X Weekly Avg. Total Born) = Fertility Score.

Farm 1 Description

A 2,200 commercial sow confinement facility located in the Midwest. Breeding occurred in a crated breeding row in the gestation building. A

“teaser” boar was utilized during heat detection and breeding to stimulate females. Heat detection and breeding occurred simultaneously in the morning. Facility breeding pattern for all

females was AM, AM, and AM (if possible). A “very experienced” technician accounted for 90% of all matings. The matings for the trial occurred between 3/3/2003 and 5/3/2003.

Farm 1 Data	GEDIS®						Conventional AI					
	Week	Bred	Farr	% Farr	Total Born	Avg. Total Born	Fertility Index	Bred	Farr	% Farr	Total Born	Avg. Total Born
03-10	56	51	91.07	642	12.59	1146.43	58	54	93.10	650	12.04	1120.69
03-11	61	46	75.41	571	12.41	936.07	60	55	91.67	640	11.64	1066.67
03-12	60	53	88.33	663	12.51	1105.00	61	55	90.16	669	12.16	1096.72
03-13	57	46	80.70	611	13.28	1071.93	64	53	82.81	649	12.25	1014.06
03-14	60	48	80.00	603	12.56	1005.00	58	49	84.48	602	12.29	1037.93
03-15	112	100	89.29	1233	12.33	1100.89	5	5	100.00	64	12.80	1280.00
03-16	5	3	60.00	37	12.33	740.00	113	97	85.84	1235	12.73	1092.92
03-17	128	112	87.50	1403	12.53	1096.09	0	0	0.00	0	0.00	0.00
03-18	6	6	100.00	63	10.50	1050.00	123	102	82.93	1241	12.17	1008.94
Weighted Avg. Totals	545	465	85.32	5826	12.53	1068.99	542	470	86.72	5750	12.23	1060.89

GEDIS® Fertility Score	1068.99	Conventional Fertility Score	1060.89
GEDIS® % of Conventional AI		.76%	

Labor & Time Comparison (Table 2)

Trial Week	GEDIS AI Catheter Average Insemination Time	Conventional AI Method Average Insemination Time
03-10	1.26	2.203
03-11	1.326	2.536
03-12	1.135	2.203
03-13	1.234	1.799
03-14	1.271	2.223
03-15	2.146	0.000
03-16	0.000	4.008
03-17	2.191	0.000
03-18	0.000	4.359
Average Time	1.544	2.834
GEDIS Savings	1.29	
	If the farm does 250 matings / week	
Labor Savings / Wk	5 Hrs 22 Min	

Farm 1 Results

The GEDIS® catheter had an advantage in Total Born of .31 pigs more per litter when compared with those litters bred using a foam catheter with a cochette semen package system, while being slightly lower in overall farrowing rate by 1.5%.

The GEDIS® resulted in a .76% improvement in the average fertility score due to improved reproductive performance.

Table 2 summarizes the average time it took for the technician to inseminate a sow using each type of catheter. The GEDIS® had a clear advantage over foam catheters of 1.29 minutes per mating. When applied over the entire weeks breeding, this equals a savings of almost 5 ½ hours. The timesavings advantage may even be even greater in breeding barns that use multiple technicians.

Farm 2 Description

A 650 sow genetic multiplier located in the Midwest. All sows are housed in gestation stalls. Breeding occurred in a crated breeding row in the gestation building. Gilts are developed and initially bred in pens in the sow unit prior to being moved into the production flow. A “teaser” boar was utilized during heat detection and breeding to stimulate females.

Heat detection and breeding occurred simultaneously in the morning. Facility breeding pattern for all females - AM, AM, AM (if possible). Breeding was performed by 2 breeding technicians at the farm. This facility has had a history of challenges with breeding performance. The matings for the trial occurred between 11/3/2003 and 1/24/2003.

Farm 2 Data	GEDIS®						Conventional AI						
	Week	Bred	Farr	% Farr	Total Born	Avg. Total Born	Fertility Index	Bred	Farr	% Farr	Total Born	Avg. Total Born	Fertility Index
	03-45	22	18	81.82	216	12.00	981.82	19	18	94.74	203	11.28	1068.42
	03-46	19	14	73.68	170	12.14	894.74	18	14	77.78	168	12.00	933.33
	03-47	16	14	87.50	193	13.79	1206.25	14	8	57.14	96	12.00	685.71
	03-48	15	9	60.00	112	12.44	746.67	16	7	43.75	79	11.29	493.75
	03-49	19	13	68.42	172	13.23	905.26	16	12	75.00	143	11.92	893.75
	03-50	23	17	73.91	200	11.76	869.57	13	10	76.92	127	12.70	976.92
	03-51	14	11	78.57	134	12.18	957.14	11	8	72.73	75	9.38	681.82
	03-52	9	7	77.78	84	12.00	933.33	7	4	57.14	43	10.75	614.29
	04-01	15	10	66.67	126	12.60	840.00	10	5	50.00	64	12.80	640.00
	04-02	15	14	93.33	172	12.29	1146.67	11	8	72.73	91	11.38	827.27
	04-03	16	11	68.75	131	11.91	818.75	11	7	63.64	78	11.14	709.09
	04-04	15	11	73.33	124	11.27	826.67	17	11	64.71	131	11.91	770.59
Weighted Avg. Totals		198	149	75.25	1834	12.31	926.26	163	112	68.71	1298	11.59	796.32

GEDIS® Fertility Score	926.26	Conventional Fertility Score	796.32
GEDIS® % of Conventional AI		16.32%	

Farm 2 Results

The GEDIS® catheter had an advantage in Total Born of .72 pigs more per litter when compared with those litters bred using a foam catheter with a cochette semen package system. The farrowing

rate was found to be 6.54% greater for the GEDIS® catheter over the 12 weeks of the trial.

The GEDIS® catheter resulted in a 16.32% advantage in fertility score due to the improvement in reproductive performance.

Farm 3 Description

An 800 commercial sow confinement production facility located in the Midwest. Heat detection and breeding occurred in a “Levis” style breeding room with sows being taken individually to a breeding pen with boars located outside the pens in adjacent stalls.

Animals detected in heat were bred in the heat check pen and returned to their gestation crated after insemination. Facility breeding pattern for all females - AM, AM, AM (if possible). Breeding is performed by 3 breeding technicians at this farm. This facility has had a history of challenges with breeding performance. The matings for the trial occurred between 11/10/2003 and 1/24/2003.

Farm 3 Data	GEDIS®						Conventional AI					
	Bred	Farr	% Farr	Total Born	Avg. Total Born	Fertility Index	Bred	Farr	% Farr	Total Born	Avg. Total Born	Fertility Index
03-46	13	13	100.00	160	12.31	1230.77	14	11	78.57	135	12.27	964.29
03-47	9	6	66.67	61	10.17	677.78	6	2	33.33	16	8.00	266.67
03-48	9	7	77.78	78	11.14	866.67	7	6	85.71	62	10.33	885.71
03-49	6	6	100.00	80	13.33	1333.33	8	4	50.00	53	13.25	662.50
03-50	6	6	100.00	70	11.67	1166.67	7	6	85.71	69	11.50	985.71
03-51	8	8	100.00	95	11.88	1187.50	8	6	75.00	71	11.83	887.50
03-52	8	5	62.50	41	8.20	512.50	8	6	75.00	69	11.50	862.50
04-01	11	9	81.82	118	13.11	1072.73	11	6	54.55	77	12.83	700.00
04-02	7	6	85.71	68	11.33	971.43	9	8	88.89	90	11.25	1000.00
04-03	6	4	66.67	51	12.75	850.00	13	11	84.61	131	11.90	1007.62
04-04	14	8	57.14	102	12.75	728.57	12	11	91.67	137	12.45	1141.67
Weighted Avg. Totals	97	78	80.41	924	11.85	952.58	103	77	74.76	910	11.82	883.50

GEDIS® Fertility Score 952.58 Conventional Fertility Score 883.50

GEDIS® % of Conventional AI	7.82%
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Farm 3 Results

The GEDIS® catheter had an advantage in Total Born of .03 pigs more per litter when compared with those litters bred using a foam catheter with a cochette semen delivery system. The GEDIS® catheter matings resulted in a 5.65% increase in farrowing rate.

The GEDIS® catheter resulted in a 7.82% higher average fertility score due to the reproductive improvements.

Summary and Conclusions

The trial data suggests that the GEDIS® catheter when compared to conventional AI practices causes no detrimental loss in total born or farrowing rate. The data suggests that on farms that have lower farrowing rates that there is an improvement in overall reproductive performance with the use of the GEDIS® system resulting in an increase in farrowing rate and total born. This positive impact may be due to the following: Improved sanitation of the insemination rod, improved breeding consistency by reducing technician variability

during semen delivery, improved breeding consistency by allowing for quicker insemination of semen after estrus detection.

In addition the GEDIS® system does result in time saving...Saving time when compared to conventional AI practices, allows breeding technicians to be more labor efficient, saves time

while reducing labor per insemination by at least 50%

Other advantages of the GEDIS catheter...

It can be used on any parity female, it is easy to use and can be mastered quickly by breeding technicians, it can be used in any type of production facility where conventional AI is utilized.