AI, IUI, DIUI,

WHICH ONE IS RIGHT FOR MY FARM?

Did you ever think an Artificial Insemination device could give you a 2000–7,000% + return on your investment (ROI)?

Decades ago, a novel approach to pig breeding was introduced that is nowadays status quo. When the new technology was first introduced, it took special people, leaders in the industry, and people with a vision to take a risk and "change" the way they had always bred in the past. Yes, we are talking about "traditional cervical artificial insemination" (or AI).

Although the advantages were many, there were skeptics that refused to adapt to the new technology, regardless of its benefits and additional profit it could create for the farm.

Change is very difficult for many people to accept at times; and today's options pose even more considerations. With that said, let's begin by defining the acronyms **AI, IUI, DIUI, and a hybrid of IUI and DIUI (Absolute's AMG Series™)**

AI, or traditional Artificial Insemination simply uses a tubular pipette with a foam tip and usually a soft rubber end to accept a variety of semen containers. This is a cervical insemination; meaning that the foam tip is lodged into the beginning of the cervix, and the sow or gilt draw the semen from the bottle, flat pack, or tube via contractions when she is stimulated. Usually, there is a boar present, and/or a technician that rubs the flanks, administers back pressure and performs other types of stimulation to assist (or bring on) the animal's contractions.

IUI, or "Intra-Uterine Insemination" generally consists of a relatively small diameter rigid tube, inside a regular traditional pipette. This smaller tube is gently pushed through the cervix and directly into the uterus.

While there can be advantages to this method, it has been relatively slow to catch on due to the potential of hurting the animal by scraping or puncturing delicate tissues in the reproductive tract. These dangers can be magnified since this type of pipette also collects a small amount of bacteria laden matter when it is threaded through the cervix. Even when the process is performed by highly trained technicians or Veterinarians, there is no way of keeping this little plug of unmentionables out of the reproductive tract

The cervix's primary role is to keep bacteria and contaminants from entering the uterus and uterine horns (the animal's reproductive tract). Once this substance enters the uterus, the animals are more prone to infections, abortions, smaller litter sizes, and lesser farrowing percentages.

Next we have the **DIUI, or Deep Intra-Uterine Insemination.** This is a very controversial procedure; one that uses a thin flexible tubular pipette that is approximately 1.7 meters in length. The extreme length of this tube allows it to be inserted all the way to the UTJ (uteral tubal junction) where its design allows it to place very small amounts of semen (albeit in only one horn).

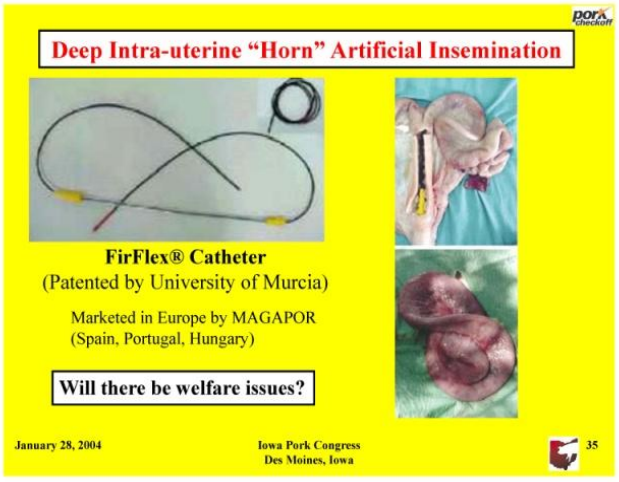
The following link, submitted by the CENTER FOR

"Investigation of the uterine lining after insertion of the DIUI catheter revealed evidence of bleeding, warranting further investigation of the viability of widespread use of the Firflex® catheter, despite the promising fertility achieved here with low doses of spermatozoa."

ADVANCED TECHNOLOGIES IN ANIMAL GENETICS AND REPRODUCTION (REROGEN), FACULTY OF VETERINARY SCIENCE, THE UNIVERSITY OF SYDNEY, NSW 2006, AUSTRALIA, explains the process in greater detail. http://www.ncbi.nlm.nih.gov/pubmed/17275224

The presentation immediately above was produced by Dr. Don Levis, The Ohio Pork Industry Center, The Ohio State University, and Swine Vet. Center; among others. Slides 28-32 relate to the AMG Series™ catheter when it was called the Absolute Catheter (click on image to view .pdf file);

and slides 33-35 are specific to the FirFlex® DIUI model of catheter.



Will there be welfare issues?

Don G. Levis, PhD

Needless to say, this method of breeding might work in clinical trials performed by elite doctors in their trade; but this technology is not ready for mainstream use in production farms. Going to such extremes to save a few milliliters of semen, hardly justifies the risks and difficulties of integrating this technology into mainstream production farms.

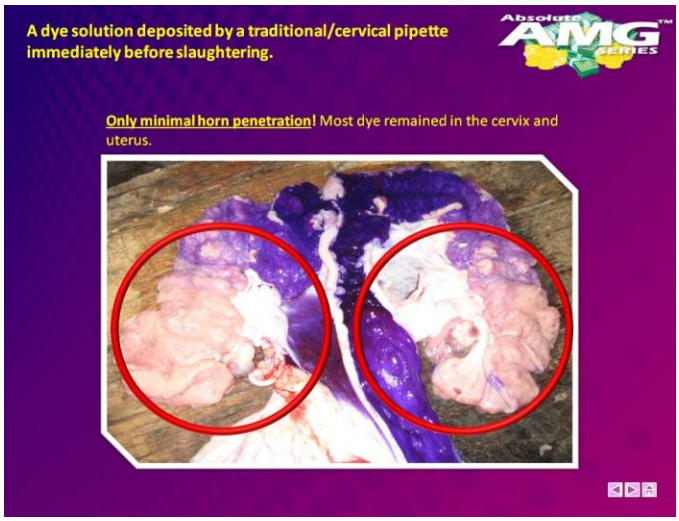
There is a better way! **Absolute Swine Insemination Co., LLC (ASIC)** combines the performance of DIUI and the relative safety of traditional cervical inseminations with their hydraulic AMG Series™ catheters; and they do it safely and effectively in "both" horns at the same time.

ASIC's patented technology has a very flexible membrane hiding inside their specially designed plastic catheter. This membrane moves forward when a technician squeezes on the semen tube, flat pack, bottle, or any semen container in the market today. Since the AMG™ pipette's membrane turns itself inside out while moving forward, the aforementioned plug of bacteria is actually re-deposited at the very beginning of the cervix. The only substance entering the reproductive tract of your animals is what is inside the semen container.

Immediately below is a picture of a parity 4 sow's reproductive tract. This animal was "injected" with a dye substance using the AMG Series™ of catheters. Immediately after injecting the dye, the animal was culled and her reproductive tract was removed and opened. As you can see, the dye advanced up both horns to the UTJ instantaneously without any injury or risk to the animal.

Click on any of the graphics to see a full size version.

The next picture is also of a parity 4 sow bred using a traditional foam tip pipette. As you can see, the majority of semen is trapped in the cervix and some has advanced a short distance up the horns. The semen still has a long way to travel prior to reaching the UTJ awaiting ovulation; but more importantly, most of the semen will die along this journey due to Phagocytosis.



A full explanation of the Transport and Loss of Boar Spermatozoa in the Reproductive Tract of the Sow, published by the Journal of Animal Science; by N. L. First, R. E. Short, J. B. Peters and F. W. Stratman can be read at http://jas.fass.org/content/27/4/1037.full.pdf

With that said, it is essential the semen reaches the UTJ in the shortest amount of time possible. The article link above references the time span being anywhere from 10 minutes to 5 hours; the jury is not always in agreement in these matters. In the trials ASIC performed, the semen reached the UTJ and was in safe storage virtually instantaneously. This is a very important aspect of ASIC's success. Filling the UTJ with fresh viable semen gives you much greater odds at fertilizing the largest number of oocytes during ovulation. It is simple common sense; isn't it? The greater the number of strong viable semen that have not undergone the death march through the horns is undoubtedly going to give you better performance.

The AMG Series™ of catheters are much more than a hybrid artificial insemination tool. They are tools that when used properly can offer incredible profits for your farms bottom line. This technology is not for everyone… it requires ambitious people with a positive attitude that believe good performance is not always good enough! In order to monitor and calculate profits, farms and personnel need to maintain good records and documentation; they also need people willing to study, understand and believe in ASIC's suggested timing protocols.

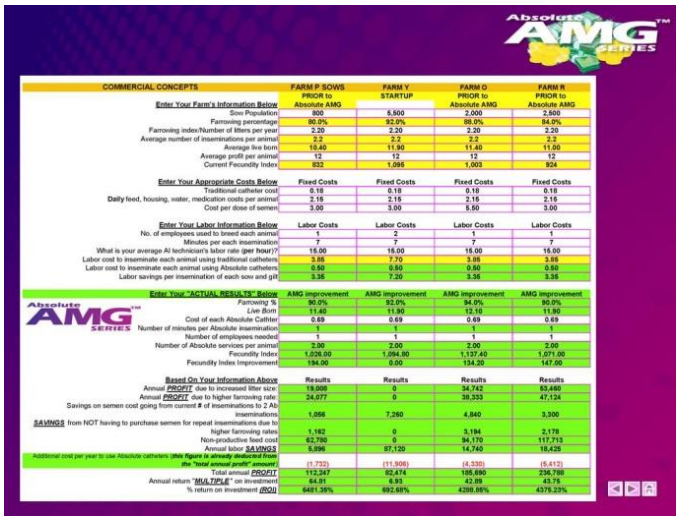
One such gentleman that has these qualities and welcomed change is Mac Magee of Commercial Concepts AI, Inc. Mac has taken 4 units to outstanding new heights; and he has been considerate enough to share the statistics with us for this article.

COMMERCIAL CONCEPTS AI,INC

Mr. Mac Magee of Commercial Concepts AI, Inc. Mac has agreed to validate all of the Commercial Concepts AI, Inc. information and can be reached by email only,
mmagee@commercialconceptsai.com

Please click on any chart or spreadsheet (a full screen file will open) to see the improvements accomplished using the AMG Series™ with ASIC's recommended insemination timing protocols.

Before and after performance on SOWs.

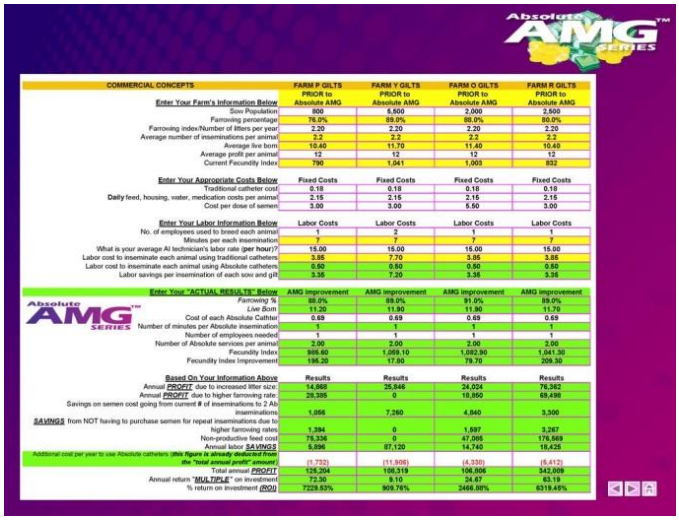


COMMERCIAL CONCEPTS	FARM P SOWS PRIOR to Absolute AMG	FARM Y STARTUP	FARM O PRIOR to Absolute AMG	FARM R PRIOR to Absolute AMG
Enter Your Farm's Information Below				
Sow Population	800	5,500	2,000	2,500
Farrowing percentage	80.0%	92.0%	80.0%	84.0%
Farrowing index/Number of litters per year	2.20	2.20	2.20	2.20
Average number of inseminations per animal	2.2	2.2	2.2	2.2
Average live born	10.40	11.90	11.40	11.00
Average profit per animal	12	12	12	12
Current Fecundity Index	832	1,095	1,003	924
Enter Your Appropriate Costs Below	Fixed Costs	Fixed Costs	Fixed Costs	Fixed Costs
Traditional catheter cost	0.18	0.18	0.18	0.18
Daily feed, housing, water, medication costs per animal	2.15	2.15	2.15	2.16
Cost per dose of semen	3.00	3.00	6.50	3.00
Enter Your Labor Information Below	Labor Costs	Labor Costs	Labor Costs	Labor Costs
No. of employees used to breed each animal	1	2	1	1
Minutes per each insemination	7	7	7	7
What is your average AI technician's labor rate (per hour)?	15.00	15.00	15.00	15.00
Labor cost to inseminate each animal using traditional catheters	3.85	7.70	3.85	3.85
Labor cost to inseminate each animal using Absolute catheters	0.50	0.50	0.50	0.50
Labor savings per insemination of each sow and gilt	3.35	7.20	3.35	3.35
Enter Your "ACTUAL RESULTS" Below	AMG improvement	AMG improvement	AMG improvement	AMG improvement
Farrowing %	80.0%	92.0%	84.0%	80.0%
Live Born	11.40	11.90	12.10	11.80
Cost of each Absolute Catheter	0.69	0.69	0.69	0.69
Number of minutes per Absolute insemination	1	1	1	1
Number of employees needed	1	1	1	1
Number of Absolute services per animal	2.00	2.00	2.00	2.00
Fecundity Index	1,026.00	1,094.80	1,137.40	1,071.00
Fecundity Index Improvement	194.00	0.00	134.20	147.00
Based On Your Information Above	Results	Results	Results	Results
Annual PROFIT due to increased litter size:	19,008	0	34,742	63,460
Annual PROFIT due to higher farrowing rate:	24,077	0	38,333	47,124
Savings on semen cost going from current # of inseminations to 2 Ab inseminations	1,056	7,260	4,840	3,300
SAVINGS from NOT having to purchase semen for repeat inseminations due to higher farrowing rates	1,162	0	3,194	2,178
Non-productive feed cost	62,790	0	94,170	117,713
Annual labor SAVINGS	5,896	87,120	14,740	18,425
Additional cost per year to use Absolute catheters (this figure is already deducted from the "total annual profit" amount)	(1,732)	(11,906)	(4,330)	(6,412)
Total annual PROFIT	112,247	82,474	185,690	236,788
Annual return "MULTIPLE" on investment	64.81	6.93	42.88	43.76
% return on investment (ROI)	6481.35%	692.68%	4288.06%	4375.23%

Collectively, the SOWs serviced by ASIC's technology provided $617,199 USD in EXTRA ANNUAL PROFIT. The ROI in the group ranged from a low of 692.68%

with the highest being 6,481.35%

Before and after performance on GILTs.



COMMERCIAL CONCEPTS	FARM P GILTS PRIOR to Absolute AMG	FARM Y GILTS PRIOR to Absolute AMG	FARM O GILTS PRIOR to Absolute AMG	FARM R GILTS PRIOR to Absolute AMG
Enter Your Farm's Information Below				
Sow Population	800	5,500	2,000	2,500
Farrowing percentage	76.0%	89.0%	80.0%	80.0%
Farrowing index/Number of litters per year	2.20	2.20	2.20	2.20
Average number of inseminations per animal	2.2	2.2	2.2	2.2
Average live born	10.40	11.70	11.40	10.40
Average profit per animal	12	12	12	12
Current Fecundity Index	790	1,041	1,003	832
Enter Your Appropriate Costs Below	Fixed Costs	Fixed Costs	Fixed Costs	Fixed Costs
Traditional catheter cost	0.18	0.18	0.18	0.18
Daily feed, housing, water, medication costs per animal	2.15	2.15	2.15	2.15
Cost per dose of semen	3.00	3.00	6.50	3.00
Enter Your Labor Information Below	Labor Costs	Labor Costs	Labor Costs	Labor Costs
No. of employees used to breed each animal	1	2	1	1
Minutes per each insemination	7	7	7	7
What is your average AI technician's labor rate (per hour)?	15.00	15.00	15.00	15.00
Labor cost to inseminate each animal using traditional catheters	3.85	7.70	3.85	3.85
Labor cost to inseminate each animal using Absolute catheters	0.50	0.50	0.50	0.50
Labor savings per insemination of each sow and gilt	3.35	7.20	3.35	3.35
Enter Your "ACTUAL RESULTS" Below	AMG improvement	AMG improvement	AMG improvement	AMG improvement
Farrowing %	80.0%	89.0%	91.0%	89.0%
Live Born	11.30	11.90	11.90	11.70
Cost of each Absolute Catheter	0.69	0.69	0.69	0.69
Number of minutes per Absolute insemination	1	1	1	1
Number of employees needed	1	1	1	1
Number of Absolute services per animal	2.00	2.00	2.00	2.00
Fecundity Index	988.60	1,089.10	1,082.90	1,041.30
Fecundity Index Improvement	196.20	17.80	79.70	209.30
Based On Your Information Above	Results	Results	Results	Results
Annual PROFIT due to increased litter size:	14,868	25,846	24,024	76,362
Annual PROFIT due to higher farrowing rate:	26,386	0	18,850	69,498
Savings on semen cost going from current # of inseminations to 2 Ab inseminations	1,056	7,260	4,840	3,300
SAVINGS from NOT having to purchase semen for repeat inseminations due to higher farrowing rates	1,394	0	1,597	3,267
Non-productive feed cost	75,336	0	47,085	176,569
Annual labor SAVINGS	5,896	87,120	14,740	18,425
Additional cost per year to use Absolute catheters (this figure is already deducted from the "total annual profit" amount)	(1,732)	(11,906)	(4,330)	(6,412)
Total annual PROFIT	125,204	108,319	106,806	342,009
Annual return "MULTIPLE" on investment	72.30	9.10	24.67	63.19
% return on investment (ROI)	7229.53%	909.76%	2466.88%	6319.45%

Collectively, the GILTs serviced by ASIC's technology provided $682,338 USD in EXTRA ANNUAL PROFIT. The ROI in this group ranged from a low of 909.75%
with the highest being 7,229.53%

Performance like this is not achieved by a magic wand catheter; it requires good management, accurate heat detection, genetics, nutrition, vaccination programs, accurate record keeping, and of course good technicians.

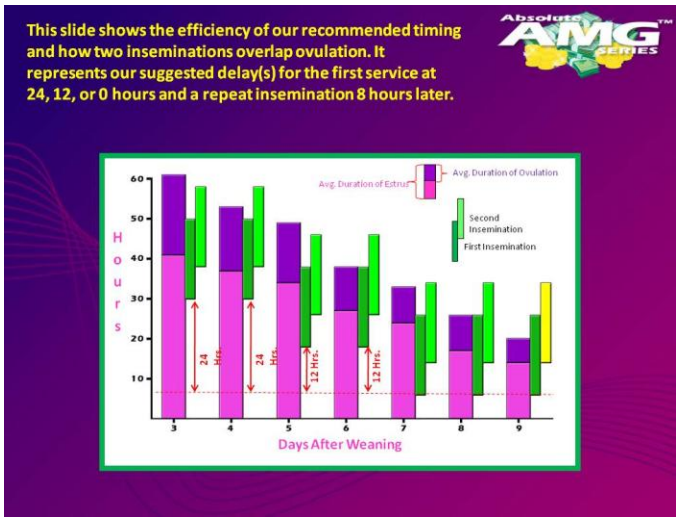
This is where the second phase of the AMG Series™ both differs and excels over conventional AI methods. ASIC's timing protocols are based on individual animal's physiology; there is no blanket system where you breed all animals on the 4th or 5th day post weaning… and the animals are also heat checked and bred twice per day (AM & PM).

Many of you at this stage will simply say we can't do that, we don't have the crew or the time (this is where the positive attitude plays its role). When you can breed your animals on an average of one minute or less per service, a great deal of time is provided for you, simply due to the speed of servicing. Your crew will have more time to spend accurately heat detecting and all the other chores at hand that consumed the time necessary to heat detect and breed twice a day before.

The first part of any successful breeding program is of course, heat detection. If your people are breeding animals too early or too late, your results will be meager. If you breed like many examples shown in a downloadable PowerPoint Presentation a little further in this article, you will easily see how important the heat detection and timing actually is.

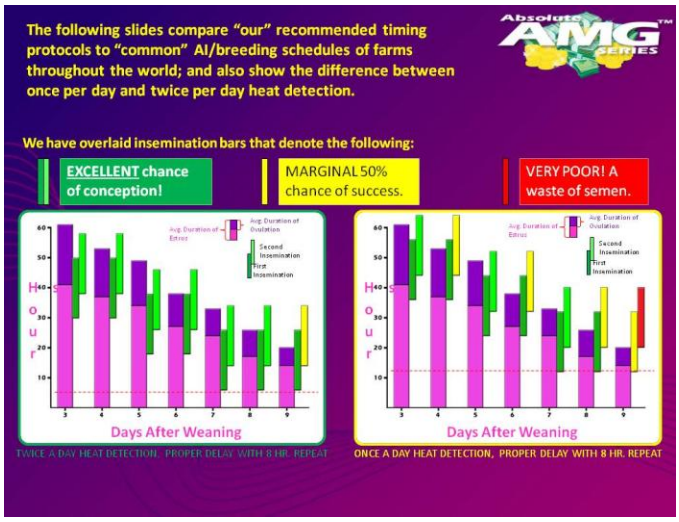
The first slide you see below depicts our recommended protocols which overlap ovulation almost perfectly. Heat detection was performed twice per day as well as breeding. The green bars are the semen doses and the purple portion of the bar is ovulation.

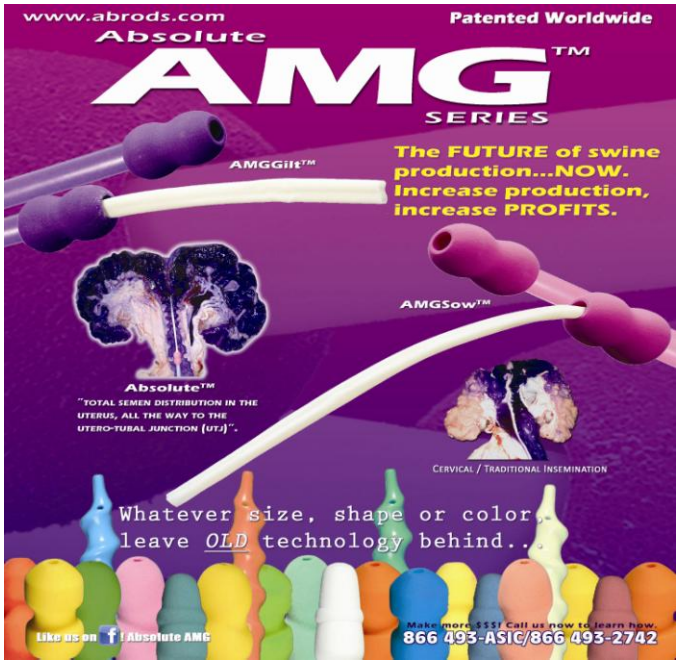
Please notice how the duration of estrus shortens every day post weaning. Both estrus and ovulation cycles become shorter as the days after weaning become greater.



The next slide represents the same graph, with the only difference being this group was heat checked only once per day. We use green, yellow, and red just like traffic lights. Green is a go, yellow is use caution, and red means stop; you will either waste your dose of semen or you could abort the animal if she conceived during the first insemination and no longer was in estrus and/or ovulating.

The next slide shows comparison in accuracy between twice per day heat checking and once per day.



The Insemination Timing Suggestions PowerPoint presentation can now be viewed on any Windows based computer. There is no need for you to have PowerPoint installed. You will be amazed how some very common and accepted procedures end up being so wrong. It is hard to imagine or explain in words; therefore the slides are animated to help make our point.

We could write a book about our procedures and benefits your farm can achieve. Actually, we have done better than that. You can now view our entire tutorial presentation online anytime, anywhere without signing up. To view our latest presentation, click on the image below.