Technologies to Enhance Swine Production Profitability

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Concepts, Ideas and Technologies That I Will Introduce

- Technologies that can increase profitability
  - Genetic technologies
  - Computer technologies
  - Management technologies
  - Reproductive technologies
  - Nutritional technologies
  - Health technologies
  - Data management technologies

What Influences Efficiency of Pork Production?

- Pork = Genetics + Environment
  - Genetics = Selection + Mating system + Semen delivery system.
  - Environment = Nutrition + Health + Housing + Management + Etc.

GOAL = Maximum Profit

- Profit = Return - Cost of Production
- Return = market volume * price
- Volume = #animals sold * weight

Return is then Dependent On:

- Volume being a function of:
  - reproductive rate
  - growth rate
  - survival rate
- Price being a function of:
  - leaness
  - meat quality
  - marketing expertise

Cost of Production = Feed + Facilities + Labor + Genetics

- Feed costs:
  - function of feed conversion, feed price and volume marketed.
- Facilities and Labor:
  - function of volume and price.
- Genetics:
  - function of cash costs, cash returns, interest costs, multiplication costs.

Genetic Technologies

- Terminal cross mating system
- Optimal genetic system structures
- BLUP based selection programs

Terminal Cross Mating System

- Purebred animals are the basis (starting point) for all genetic programs
- There are different breeds of purebred swine that have been developed for different purposes
- White breeds (for maternal purposes)
- Colored breeds (for paternal purposes)

Advantages of a Terminal Cross Mating System

- Heterosis
  - you can increase the pounds of pork marketed per sow per year by +45% using an efficient terminal cross mating system
- Specialized sire and dam lines

Role of the Sow in Pork Production

- Sows (maternal lines)
  - role is to cycle in heat, accept the boar, stay pregnant, have a large litter of pigs, keep them alive to weaning, milk well, wean a large litter of heavy pigs, provide one half the genes for fast growth, high lean content and high eating quality, recycle quickly, and do all this again
- Maternal breeds are Landrace, Large White (or Yorkshire) and Welsh

Roles of the Boar in Pork Production

- Boars (sire lines)
  - role is to exhibit libido, breed the females (or have semen collected), produce fertile semen that will inpregnate the sow, provide one half the genes to the offspring that are superior for fast growth, high lean content and high eating quality
- Sire line breeds are Durocs, Hampshires, Pietrains

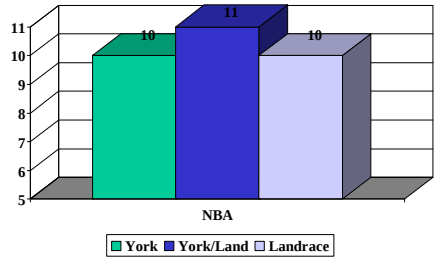
Terminal Cross Mating System Sire and Dam Lines

- Use animals of maternal breeds for the sow lines
  - Landrace, Large White and Welsh
- Use animals of sire breeds for the boar lines
  - Durocs

What is Heterosis?

- Heterosis is the increased performance of crossbred animals (above the average of their parents) because the parents are of different breeds

Heterosis



Heterosis Levels

- Litters/sow/year = +18%
- Litter size = +8%
- Preweaning mortality = -5%
- Growth rate = + 5%
- ----------
- Pounds product/sow/year = +40%

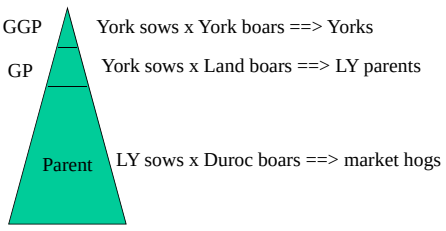
Structure of the Genetic System

- To maximize pig flow from existing facilities
- To minimize non-productive sow days
- To improve product quality
- To minimize cost of production
- To maximize profit

Genetic System Decisions

- Structure of the genetic pyramid
  - Breeds used in GGP, GP and Parent levels
  - Mating system used at each level
- Selection program in the GGP and GP
  - Which traits
  - Accurate performance measurement program
  - Accurate BV estimation program
- Semen delivery system (natural or AI)

What is a Traditional Genetic Program in the USA?



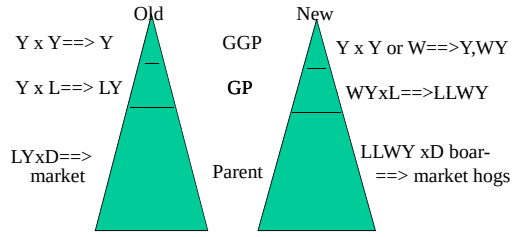
Genetic Structure (10,000 sow pyramid)

- GGP = 300 Yorkshire sows
  - Y sows X Y boars ==> York GGP gilts
- GP = 1200 Yorkshire sows
  - Y sows X Landrace boars ==> LY parent gilts
- Parent = 8500 LY sows
  - LY sows X Duroc boars ==> market hogs

Genetic Cost of Production

- Assumptions:
  - All AI
  - 24 pigs/sow/year in parent stock
  - 45% annual replacement rate in Parents
  - 50% annual replacement rate in GP
  - 60% annual replacement rate in GGP
  - 9% interest on operating capital
- $717,493/year or $ 3.29/pig

Old versus New Genetic Pyramid



New Genetic Structure (10,000 sow pyramid)

- GGP = 300 Yorkshire sows
  - (25%) Y sows X Y boars ==> York GGP gilts
  - (75%) Y sows X Welsh boar => WY GP gilts
- GP = 1200 Welsh/York F1 sows
  - WY sows X Land. Boars ==> LLWY parents
- Parent = 8500 LLWY sows
  - LLWY sows X Duroc boars ==> market hogs

New Heterosis Levels

- 10,000 total sows
  - 300 purebred GGP sows
    - 0% maternal heterosis
    - 75% pig heterosis (since only 25% pure matings)
  - 1200 F1 GP sows
    - 100% maternal heterosis
    - 100% pig heterosis
  - 8500 Three-way cross parent sows
    - 100% maternal and pig heterosis

New Genetic Cost of Production

- Same assumptions as before:
  - All AI
  - Replacement rates of 45% in parents, 50% in GP, 60% in GGP
  - 9% interest on operating capital
- $ 2.68/pig
- $ 597,221/year
- Savings = $ 120,272 / year or $ 0.61 / pig

Requirements for New Genetic Pyramid

- Third white maternal breed
  - that is unrelated to other breeds in program
  - that is available for purchase
  - that has correct health level

Traits to Focus On for Profit

- Reproductive traits
  - farrowing rate, litter size, preweaning mortality, wean-estrus interval, non-productive sow days
- Growth traits
  - growth rate (ADG, days to market), feed conversion, mortality rate
- Carcass traits
  - backfat, loin muscle area, percent lean, marbling, color, pH, water holding capacity

Non-Productive Sow Days

- Defined as any time an animal (sow) is in the herd and is not pregnant or nursing a litter.
- She accumulates feed costs, fixed costs, interest costs and opportunity costs.

NPSD Components

- Entry to first service interval
  - function of management decisions and early puberty
- Farrowing rate
  - function of boar fertility, sow fertility and management expertise
- Wean to estrus interval
  - function of management (sow condition, weaning age) and genetic ability of sow

Reducing NPSD

- Management
  - Gilt development program to enhance cycling
  - Estrous detection program to quickly and accurately find cycling females
  - High quality AI program with fertile boars and trained inseminators
  - Sow feeding program to enhance feed intake and lower wean to estrus interval

Genetic Influence on NPSD

- Early puberty
  - rarely measured, heritability = 0.25
  - closely associated with growth rate
- Farrowing rate
  - confounded with boar fertility
- Wean to estrous interval
  - easy to measure
  - moderately low heritability = 0.22

Reducing NPSD - Genetics

- If possible, find a seedstock source that includes wean to estrous interval (W2E) in their genetic improvement program
- Include wean to estrous interval (W2E) in your selection program at the GGP and GP farms
- BLUP sow indexing program for overall genetic improvement in reproduction

BLUP Sow Indexing

- Primary reproductive traits are farrowing rate, number born alive, litter weaning weight and wean to estrous interval
- Farrowing rate is confounded with boar fertility and not clean to measure
- Other traits are lowly heritable
- Therefore, BLUP genetic evaluation system is needed to make genetic progress

Advantages of BLUP System

- Defines performance as the sows contemporary group deviation (CG)
  - Sow contemporary group is a group of sows that were bred together, housed together and farrowed together
  - CG deviation allows performance to be expressed without those environmental effects
  - Increases accuracy of BV estimation

Advantages of BLUP System

- Combines the performance information on a sow with all her relatives data
  - Example: sow BV based on 4 of her litter records plus litter records from her daughters, half sisters, cousins, etc.
  - This greatly increases the accuracy of the BV estimation
- Proven to produce the fastest genetic gains

BLUP Sow Indexing

- What does it do?
  - Estimates the breeding value of animals for litter size, litter weight and wean to estrous interval
  - Creates an SPI from the BV estimates for use in selection
  - Estimates this BV with the most accuracy

Weaned Sow
Animal Report
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Farm: Colorado Farm — Rec: 24 Date: 3-9-99

ID	Sire	Dam	No. Rec	No. Prog	Sow Brd	BV NBA	BV LWT	BV W2E	SPI
258LW	553LW	202LW	6	9	LAR	1.58	6.6	1.3	160
113L	0196L	0145L	12	32	LAN	1.23	2.8	0.4	145
147LW	1844LW	3829LW	11	55	LAR	1.62	0.9	1.7	145
103D	196D	80D	7	0	DUR	0.68	1.1	-2.2	139
271LW	555LW	147LW	7	0	LAR	1.53	-2.0	0.9	139
421LW	KENRAALI	270LW	2	0	LAR	1.10	1.6	0.4	138
76D	173D	1220D	11	21	DUR	0.75	-1.6	-1.8	133
165LW	531LW	2822LW	10	0	LAR	0.73	-0.3	-0.9	130
442LW	565LW	270LW	1	0	LAR	0.73	3.4	0.9	127
274L	UUNI	211L	4	0	LAN	0.54	2.4	-0.4	127
415LW	JAAKKO	2191LW	2	0	LAR	0.68	2.1	0.3	125
416LW	TUOMO	2181LW	2	0	LAR	0.74	3.5	1.3	124
443LW	DIAMOND	244LW	1	0	LAR	0.18	2.5	-1.0	119
292LW	557LW	117LW	6	4	LAR	0.19	2.1	-0.8	116
252L	973L	182L	5	0	LAN	0.34	1.0	-0.1	114
304L	974L	192L	2	1	LAN	0.77	-2.8	0.8	113
444LW	565LW	249LW	1	0	LAR	0.30	-2.1	0.2	103
133D	BERNARD	114D	3	0	DUR	0.34	-5.5	0.9	92
305LW	557LW	91LW	6	2	LAR	-0.23	-1.8	0.2	87
049YL	563LW	284L	1	0	XB	-0.53	0.8	0.1	84
445LW	565LW	270LW	1	96	LAR	-0.44	-2.4	-0.3	81
420LW	563LW	286LW	2	0	LAR	-0.55	-1.3	-0.4	81
405LW	UPPSALA	297LW	3	0	LAR	-0.65	1.5	0.3	80
422LW	KENRAALI	166LW	2	0	LAR	-1.15	0.6	-0.7	68
			4	9		0.44	0.6	0.0	115

Animal Report
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Farm: Colorado Farm Rec: 48 Date: 3-9-99

ID	Sire	Dam	No. Rec	No. Prog	Sow Brd	BV NSA	BV LWT	BV W2E	SPI
227L	978L	139L	7	2	LAN	1.36	1.2	-0.8	153
232L	976L	162L	6	1	LAN	1.09	0.4	-1.9	149
248L	975L	151L	5	0	LAN	0.88	3.1	-0.4	139
206L	976L	144L	7	2	LAN	0.79	1.8	-1.1	138
235L	973L	113L	5	0	LAN	1.04	2.2	0.4	137
246L	978L	196L	5	1	LAN	0.72	-0.3	-1.8	135
251L	978L	165L	4	0	LAN	0.70	0.7	-1.3	133
216L	973L	0145L	6	7	LAN	0.99	2.8	1.6	129
274L	UUNI	211L	4	0	LAN	0.54	2.4	-0.4	127
262L	974L	163L	4	0	LAN	0.31	3.2	-1.1	125
255L	975L	153L	4	2	LAN	0.21	2.1	-1.7	123
211L	975L	110L	6	17	LAN	0.63	-0.4	-0.5	123
171L	969L	59L	8	3	LAN	0.87	-3.1	-0.2	122
170L	971L	0145L	8	13	LAN	0.45	1.6	-0.6	122
292L	978L	173L	2	0	LAN	0.37	-1.2	-1.7	121
275L	978L	151L	3	0	LAN	0.66	-1.7	-0.4	120
285L	978L	209L	3	0	LAN	0.57	-1.6	-0.8	120
288L	978L	203L	3	0	LAN	0.58	1.3	0.4	120
169L	969L	59L	8	3	LAN	0.28	-0.2	-1.6	119
267L	UUNI	194L	4	0	LAN	0.43	-0.9	-1.0	119
295L	974L	203L	2	0	LAN	0.71	0.0	1.0	117
284L	UUNI	211L	4	1	LAN	0.17	2.2	-0.6	115
252L	973L	182L	5	0	LAN	0.34	1.0	-0.1	114
297L	974L	203L	3	0	LAN	0.15	1.2	0.0	108
296L	974L	203L	2	0	LAN	0.54	0.1	1.7	107
260L	974L	170L	4	0	LAN	-0.08	-0.1	-1.4	106
259L	974L	170L	4	0	LAN	0.14	-1.8	-0.6	105
289L	978L	207L	3	8	LAN	0.25	-1.5	0.4	102
266L	UUNI	194L	3	2	LAN	0.13	2.0	1.1	101
283L	MYYRI	74L	3	0	LAN	0.36	-5.4	0.2	98
174L	972L	122L	8	0	LAN	-0.35	1.1	-0.5	95
281L	MYYRI	74L	4	0	LAN	0.18	-8.2	-0.9	92
268L	UUNI	194L	4	0	LAN	-0.37	0.5	-0.4	91
276L	UUNI	211L	3	0	LAN	-0.47	2.3	1.0	83
213L	973L	0145L	6	1	LAN	0.04	-0.0	2.9	82
			4	2		0.34	0.3	0.3	114

BLUP Sow Indexing

- How are these BV estimates used?
  - As an aid to select the genetically superior pigs
- Where is this selection done?
  - At weaning, decide which GGP and GP sows to breed pure and which to breed cross and which to cull
  - Evaluation of current herd sires and potential herd sires

BLUP Sow Indexing

- How does this improve profitability?
  - Uses selection to make permanent genetic improvement in the herd for litter size, litter weaning weight and wean to estrous interval component of non-productive sow days

Why is BLUP Indexing Better Than What is Done Now

- Uses BLUP multiple trait technology to speed up gains
- Only system to make permanent improvement in non-productive sow days
- Works with PigChamp (or any other data management system that can extract data)
- Simple operational procedure
- Adds to genetic gain from genetic source

Who Should Use BLUP Indexing

- Seedstock suppliers
- Gilt multiplication units
- Anyone making replacement breeding stock

Requirements to Do BLUP Indexing

- PigChamp or equivalent data management system
- Computer with math co-processor (486DX or higher CPU)
- Pedigree information entered on the sows (her sire and dam)

Management Technologies

- All in / All out pig flow
- Weekly farrowing schedules
- SEW (Segregated Early Weaning)
- Multiple site
- Split sex penning
- Wean-Finish Buildings

All In / All Out Pig Flow

- Start with a room (farrowing, nursery, finishing) that is empty and clean
- Fill it with pigs (sows) that are the same in age, size or farrowing time
- After the prescribed time, empty the room (wean the sows, move the pigs)
- Clean the room, disinfect, allow to dry, sit empty

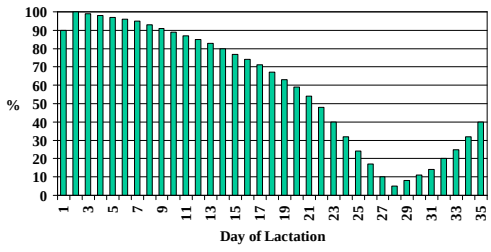
Goal of AI / AO Flow

- Break the cycle of disease build up
- Maximize the health of the herd
- Clean means clean (no fecal matter)
- Empty means empty (no pigs at all)
- Do not mix farrowing groups of animals (sows)

SEW (Segregated Early Weaning)

- Segregated refers to the fact that the pigs are taken to a location where they have no exposure or interaction with the sow herd
  - either directly exposed or indirectly exposed by the same people contacting both sows and pigs
- Early weaning refers to the procedure of weaning the pigs while they still have adequate antibodies to resist any diseases the sow might expose them to

Antibody Level at Weaning Time



Benefits and Problems with SEW

- Better health level of pigs and sows
- Increased growth rate post-weaning (+10%)
- Better survival to market
- More Litters/sow/year
- Potential for more Pigs/sow/year
- Requires better management of pigs
- Very early weaning (under 14 days) will delay return to estrus
- Requires more expensive nursery rations

Separate Site Post-weaning

- After weaning the pigs (<21 days of age), they are moved to a separate site for nursery and finishing
  - no exposure to breeding herd either directly or from employees
- Since they were weaned while antibody levels were still high, they did not contract any diseases the sow exposed them to

Benefits and Problems with Separate Site Production

- Better health level of the pigs
- Greater growth
- Better feed conversion
- Less mortality
- Must be large enough to maintain a two site pig farm
- Generally requires more capital

Split Sex Penning

- Boars, barrows and gilts have different levels of aggressiveness and sexual activity
- Mixing of sexes in the finishing pens will result in male aggressiveness retarding the growth of female pigs
- Separate penning will result in faster growth rate, better feed conversion and lower mortality rates at virtually no cost

Wean-Finish Buildings

- Research has shown that every time you move and/or mix a pen of pigs, they quit growing for 5-7 days
- Wean the pigs at 15-20 days of age into a finishing building and leave in the same pen until marketed
- This does require some adaptations to the finishing facility

Wean-Finish Adaptations

- Provide zone heating area for the baby pigs (heat source above a black rubber mat over a section of slats near the back of the pen)
- Feeder must have narrower spacings between trough dividers so that the small pig does not lay in the trough
- Smaller nipples on adjustable height waterers must be used

Effects of Wean-Finish

- Faster growth rate to market (save 10 days)
- Slightly better feed conversion
- Lower labor costs since less movement of pigs and less cleaning of pens
- Poorer utilization of pen space in the early phases of growth, fewer turns of pigs/year
- Economically similar to traditional systems

Reproductive Technologies

- AI (artificial insemination)
- Central AI studs
- ET (embryo transfer)
- Semen sexing

Steps To Get a Litter

- Female must cycle (show heat)
- Female must be bred at appropriate time in correct manner with an adequate number of functional sperm
- Multiple matings during the heat period increase farrowing rate and litter size
- With natural service the boar does all this
- With AI the person must do all this

Artificial Insemination (AI)

- Heat detection in the female
- Collection of semen from boar
- Processing of semen from boar
- Insemination of the female with the semen
- Multiple matings are still desired
- If any step fails, there is no (or small) litter
  - 90% success at each step = 65% far. rate

Benefits From AI

- Allows use of better boars, thus better growth rate, feed conversion, etc. in pigs
- Enhances multiple matings
- Can reduce infection rate in sows
- Reduced number of boars needed, thus lower facility and feed costs

Challenges in AI

- Requires better management
  - heat detection, semen collection, semen processing, insemination, records
- Requires investment in AI lab
- Not everyone can be successful
  - 20% are excellent, 20% are terrible, 60% are acceptable

Central AI Stud

- The most cost efficient size of an AI stud is 100-300 boars
  - spread the fixed costs of equipment and trained labor over more sows will lower costs/sow
- This size of stud will service 10,000 sows to 50,000 sows (larger than most farms)
- This allows only the really good technicians to do AI, thus improving the results
- Requires lots of sows within delivery area

Embryo Transfer (ET)

- Identify a genetically superior female (donor), and mate her to a genetically superior male, and harvest the fertilized embryos from her after fertilization
- Place the embryos into a recipient female for her to raise to birth
- Rebreed the donor female as soon as possible to get more embryos

Embryo Transfer (ET)

- Goal is to get more offspring from the genetically superior female (increase the reproductive rate) than normal
- However,
  - cost is high, increase in reproductive rate is small compared to the investment, extremely high management level required
- Therefore, used for health repopulation needs only in extreme situations

Semen Sexing

- A process where the sperm with Y chromosome is separated from semen with the X chromosome so sex of baby animal is controlled
- Advantage
  - female offspring are leaner and better FCR
  - seedstock multipliers want gilts to sell
- Not successful currently at a good price

Nutritional Technologies

- Breeding herd feeding protocols
- Effect of Lysine level on pig performance

Breeding Herd Feeding Protocols

- After insemination, the egg is fertilized by the sperm and implantation in the uterus takes place at approximately day 15-19
- Any stress to the female during this period will kill embyros and lower litter size and farrowing rate
- Stress can come from movement of the sow, fighting, heat, changing energy levels

Gestation Feed Intake Levels To Maximize Reproduction

- Weaning to breeding
  - feed to adjust condition
- Breeding (Day 0) to Day 24
  - keep at constant feed intake level of 1.8 to 2 kg
  - prevent energy surges to maximize embryo life
- Day 25 to Day 100
  - feed to adjust condition
- Day 100 to farrowing, up feed by 0.5 kg

Effect of Lysine Level on Pig Performance

- Lysine is an expensive part of the pigs diet
- Want an level to maximize performance
- Do not want too much lysine and waste it
- How much is right??
- Results of NPPC study

Diet Decisions

- Ad lib feeding, constant energy, mineral and vitamin levels, meal form (750microns), FIRE system
- Differing levels of lysine
  - 1 = Slightly above NRC
  - 2 = At NRC
  - 3 =Slightly below NRC
  - 4 = Drastically below NRC

Table 2: Diets Evaluated

Pig Wt.	Diet 1	Diet 2	Diet 3	Diet 4
90-140	1.25%	1.10%	0.95%	0.80%
141-190	1.10%	0.95%	0.80%	0.65%
191-240	0.95%	0.80%	0.65%	0.50%
241-290	0.80%	0.65%	0.50%	0.35%
291-330	0.80%	0.65%	0.50%	0.35%

Figure 3: Diet Effects on Feed Intake

- Pigs consuming Diet 1, the high lysine diet ate more feed/day than pigs eating the other diets. (similar across genetics)

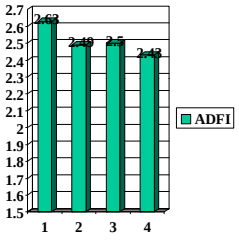


Figure 6: Diet Effects on Growth Rate

- Diet 4 (sub-NRC in lysine) significantly slowed down growth rate in all genetics

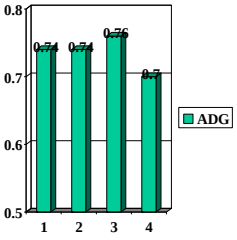


Figure 9: Diet Effects on Feed Conversion

- Diet protocols 1 and 4 were the least efficient
- Diet protocols 2 and 3 were the most efficient

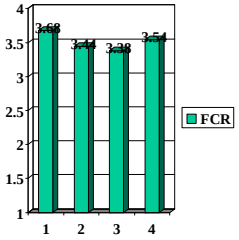
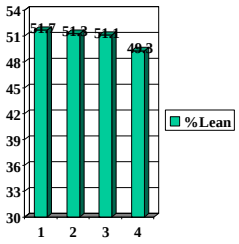


Figure 12: Diet Effects on Percent Lean

- Diet protocol 4 gave significantly lower percent lean
- Diets 1-3 were similar in percent lean, with a linear effect of % lysine



Lysine Level Effect on Pig Performance

- Too much lysine decreased performance and added cost
- Too little lysine severely decreased performance and added cost
- Diet protocol 3 (0.95% lysine decreasing to 0.50%) appears to be most cost effective

Special Topics: Data Management Programs

- Good production records are essential to the efficient management of the pig farm.
- Computerized production records offer the most opportunity to maximize your profits.
- Worldwide industry standard is:
  - PigChamp

PigChamp

- Breeding herd management.
  - Sow and boar inventories with details for each animal.
  - Accurate evaluation of reproductive performance.
    - sows, boars, ai technicians, genetic types, sires, parities, facilities
    - time frame summaries and analysis
    - data extraction for analysis

PigChamp

- Post-weaning performance.
  - Growth rates, feed costs, mortalities, feed conversion (by groups of animals).
  - Feed usage, formulation, costs.
  - Facilities performance comparisons.
  - Multiple herd comparisons.

PigChamp

- Diagnostic capabilities.
  - Reproductive traits
    - farrowing rates, litter sizes, pig mortality
  - Post-weaning traits
    - death losses, growth rates, feed conversion.
  - Data extraction
    - for all sow and boar records to assist in diagnostics.

PigChamp Events

- Inventory events
- Breeding/pregnancy events
- Farrowing events
- Weaning events
- General events

Inventory Events

- Enter
- Group
- Location
- Remove
- Lost tag
- To be culled

Breeding/Pregnancy Events

- **Boar in / Boar out**
- **Mating**
- **AI**
- **Heat No Service**
- **Skipheat**
- **Not in pig**
- **Preg. exam**
- **Abortion**

Farrowing Events

- Farrow
- Foster
- Nurse on / nurse off
- Pig deaths

Weaning Events

- Wean
- Part wean
- Litter weight

Common Terms

- **Service**
- **Mating**
- **Weaning**
- **Farrowing**
- **Parity**
- **Number born**
- **Number born alive**
- **Number weaned**
- **Stillborns**
- **Mummies**
- **Farrowing rate**
- **Adjusted farrowing rate**
- **Litters/sow/year**
- **Mortality**
- **Weaning weight**

Common Terms

- **Weaning age**
- **Pigs weaned/sow/year**
- **Inventory**
- **Gilt**
- **Sow**
- **Boar**
- **Replacement rate**
- **Culling rate**
- **Death rate**
- **Non-productive sow day**

Reproductive Areas to Analyze

- General reproductive efficiency
- Boar fertility
- Sow reproduction
- Reproductive management

General Reproductive Efficiency

- Performance Monitor
  - **breeding performance**
  - **farrowing performance**
  - **weaning performance**
  - **population**

Performance Monitor

- Breeding performance
  - **total number of services**
  - **% repeat services**
  - **% multiple matings**
  - **weaning to 1st service interval**
  - **% bred by 7 days**
  - **entry to 1st service interval**

Performance Monitor

- **Farrowing performance**
  - **number farrowed**
  - **avg. parity farrowed**
  - **number born / litter**
  - **number born alive / litter**
  - **% stillborns**
  - **% mummies**
- **Farrowing performance**
  - **farrowing rate**
  - **adj. Farrowing rate**
  - **farrowing interval**
  - **litters/sow/year**

Performance Monitor

- **Weaning performance**
  - **No. litters weaned**
  - **No. pigs weaned**
  - **pigs weaned/sow**
  - **pre-weaning mortality**
  - **avg. pig weaning weight**
- **Weaning performance**
  - **Age at weaning**
  - **21 day litter weight**
  - **pigs weaned/sow/year**

Performance Monitor

- **Population info**
  - **ending female inventory**
  - **gilt pool inventory**
  - **gilts entered**
  - **females culled**
  - **female deaths**
  - **ending boar inventory**
- **Population info**
  - **sow/boar ratio**
  - **replacement rate**
  - **culling rate**
  - **death rate**
  - **avg. non-productive sow days**

Analyzing Boar Fertility

- Boar usage report
- Boar performance report
- Database applications

Analyzing Sow Reproduction

- Parity distribution report
- Genetic line report
- Pregnancy loss report
- Removal analysis report
- Subset comparison report
- Database applications

Analyzing Reproductive Mgt.

- Action lists
- Farrowing rate report
- Genetic line report
- Matings / service report
- Database applications

Summary

- There are many technologies that the swine producer can use to lower their cost of production and enhance the value of their product
- Some are cost effective and some are not
- Knowledge of these technologies will enable the producer to make sound decisions about implementation