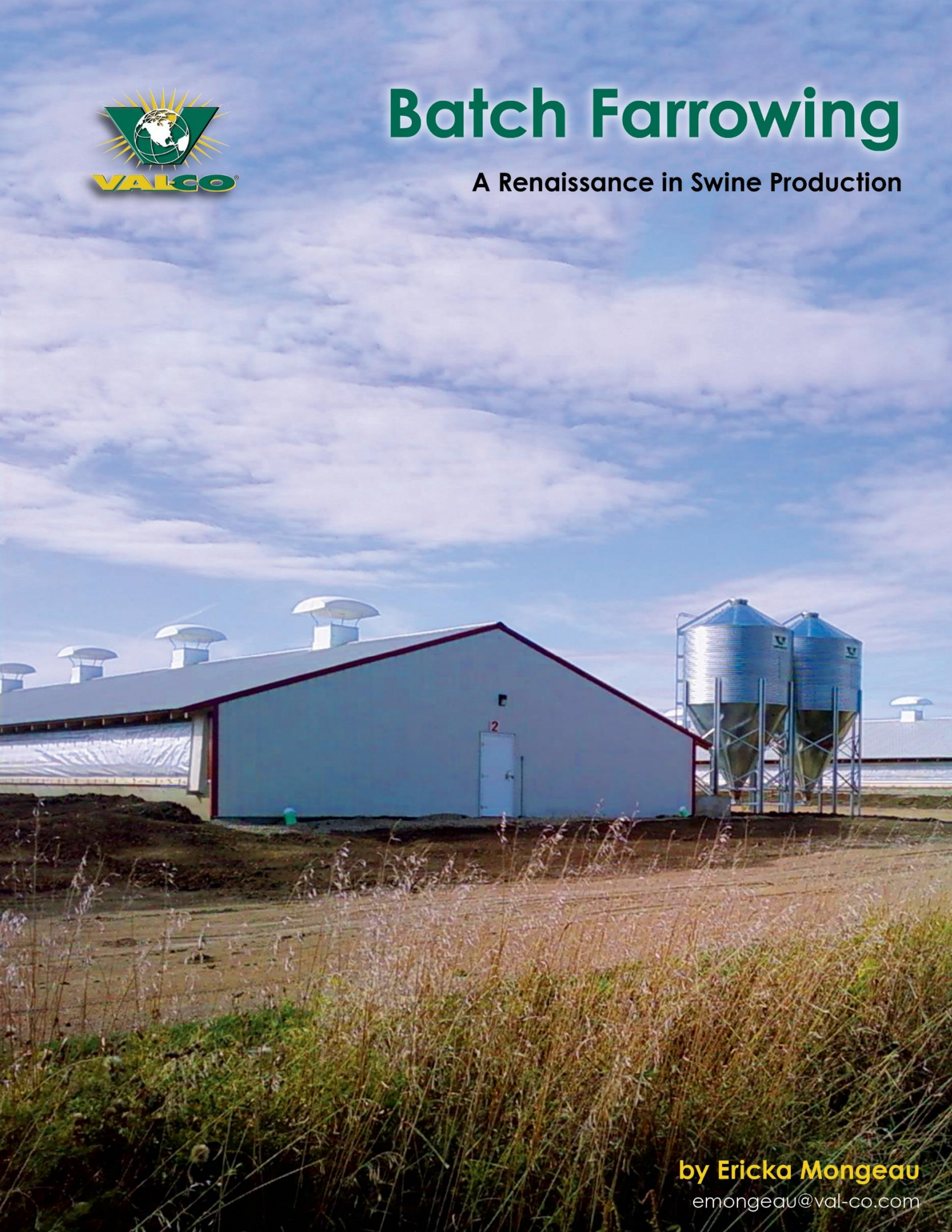
Batch Farrowing

A Renaissance in Swine Production



by Ericka Mongeau
emongeau@val-co.com

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Commercial swine farming has had a long history, but it's only more recently we see it beginning to repeat itself. When farming was more concerned with plant crops, farmers kept enough livestock to feed themselves and their neighbors. The pigs were raised with little direct management, left to forage for food, fed leftover scraps and by-products, and used to glean fields after harvest.[1] They were an essential part of any farm, grown for pork and lard, and could be a ready source of income at the market.

Originally bred in large part for lard, pigs were much fattier before the 1950s. Slowly, as animal fats were given a bad reputation and the consumer became more health-conscious, pigs became more and more lean. The evolution of pig breeds and feeds meant that pigs could grow leaner faster than ever before.[2] This also meant that the pigs didn't have the physique necessary to weather the elements, and so, pig operations were moved inside where the temperatures could be stable and controlled.

As the fat content of pork decreased, the demand for "The Other White Meat" increased. Group or batch farrowing of pigs was designed around planting and harvesting seasons when there was less labor available for the hogs.[3] Seasonal batch farrowing was used in the 60s and 70s, as pigs would be bred and farrowed during the spring and fall.[4] During the 70s and 80s pork producers moved from farrowing two times per year to more intense year-round farrowing to make better use of facilities and labor.[5] At the time, the industry practiced more All-In All-Out use of farrowing and nursery rooms with a greater focus on sanitation and pig health, but as labor became more intensive, batching fell by the way side.

There were several approaches to batching based on the number of rooms available and preferred weaning age. The simplest system had two groups of sows farrowed 12 weeks apart. A more intense system had three batches of sows farrowing eight weeks apart. Both systems used one farrowing room and one nursery. As systems became progressively more intense by breeding more batches of sows to farrow in a shorter amount of time at younger weaning ages, problems arose. Common concerns, such as when to add replacement gilts to a group, identifying returns to estrus, and fitting them into groups made batch farrowing more complicated. By the 90s there was a move to weekly farrowing (weekly farrowing could technically still be considered "batch" farrowing, but it doesn't operate under strict scheduling of tasks) to make regular use of facility investments.

Today, there is a gradual shift back towards using a batch farrowing system, in part to prevent the spread of highly contagious diseases through a herd, but also because growers have found that batch farrowing leads to a greater number of piglets that are sold at more consistent weights. Done properly, there can be less mortality, less disease, less stress, and more profit.

Unfortunately, today's pig farmers are largely uneducated in the practice of batch farrowing. It's been practiced in Australia and Europe, but the American farmer is still hesitant to commit to the shift. We outline the advantages and disadvantages of batch farrowing below, as well as some practices and guidelines to help make the transition to batch farrowing a smooth one.

[1] "The History of Heritage Pigs" Excerpt from A Rare Breeds Album of American Livestock, p 71-73
[2] Prichard, Diana. The Rise and Fall of the Great American Hog. Modern Farmer. 21 August 2013
[3] Ketchum, Ron & Rix, Mark. How Batch Farrowing Impacts Production. National Hog Farmer. 6 September 2011.
[4] Dr. Dave Baumert. "Batch Farrowing: Impact on Health and Productivity." Presentation at the 2016 Allen D. Leman Swine Conference, St. Paul, Minn. 17-20 September 2016.
[5] Ketchum & Rix, How Batch Farrowing Impacts Production.

What is Batch Farrowing?

Batch farrowing is when herds are divided into several groups of sows of similar age in the same reproductive stage. This allows for mating and farrowing to occur at a fixed interval and leads to an All-In All-Out management approach. This age-segregated rearing means pigs coming from different batches are housed in different rooms and have no direct contact.[6]

Why is batch farrowing a good practice?

Batch farrowing, when done well, can help control heard health, improve daily weight gain in piglets, and improve producers' labor and husbandry efficiency.

Because batches never come into contact with each other, flare ups of circulating diseases are contained, preventing health problems from spreading from one batch to the next. This protects piglets against disease and allows for more targeted treatment of sick pigs.

Improved health leads to faster piglet growth, improved feed efficiency, lower mortality, and reduced medication costs.[7] All-In All-Out pig flow results in improved piglet health by allowing easier treatment of routine health issues and faster elimination of disease. Improved piglet health often leads to better health throughout the entire life span of the pig, so growers also see improved wean-to-finish health.[8]

Because batch farrowing is meticulously planned, most farrowing will fall on a Monday. It is easier to plan for the necessary labor knowing that during that week, more personnel will be needed to attend to sows. Farrowing, weaning, and cleaning of rooms will all occur close together; the demand for labor is higher during these times, but employees can often safely request time off during the slower weeks without risk of needing to cancel or reschedule at the last minute. (See sample calendar, page 10.)

What problems can emerge when batch farrowing?

Batch farrowing may need to be based on a multi-site production system model, especially when space is limited. Batch farrowing helps smaller farrow-to-wean facilities produce larger groups of weaned pigs to fill larger nursery/finisher barns and reduce transport costs.[9] To keep finisher barns full, multiple sites supplying that house must work on rotation with each other to ensure that the site is always stocked.

Batch farrowing requires keen attention to scheduling so farmers and workers must be better stockman to stick to those tighter schedules. Tasks such as heat detection and breeding will need to be done in a timely and accurate manner to ensure that sows remain in a productive batch. Many of these tasks may require the use of estrus management tools, such as MATRIX®.

Boar requirements are high if artificial insemination will not be used. Early and late farrowings will extend the age and weight ranges if management doesn't intervene, and it is much more difficult to back-foster slow growing piglets.[10]

Establishing batches

Establishing batches requires careful management to ensure that sows farrow synchronously. It is wise to seek veterinary advice when switching to batches, as heat and induction medications are often required. Establishing batches can and will take time, patience, and attention to detail.

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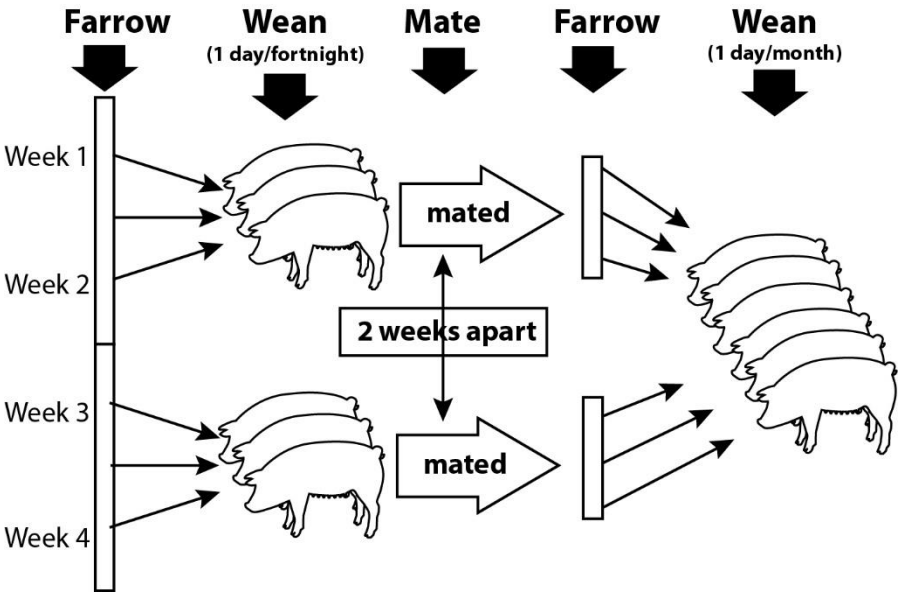
[6] A. Laurette, et al. Modeling batch farrowing management within a farrow-to-finish pig herd: influence of management on contact structure and pig delivery to the slaughterhouse 21 September 2007
[7] Armstrong, Derek. An Introduction to Batch Farrowing. Meat and Livestock Commission February 2003
[8] Dr. Dave Baumert. Batch Farrowing.
[9] Ketchum, Ron & Rix, Mark. How Batch Farrowing Impacts Production.
[10] Roese, Greg & Taylor, Graeme. Batch Farrowing for the Pig Industry. Prime Facts. Issue 143. January 2007.



1 BATCHING SOWS – DEPT. OF AG & FISHERIES, AUSTRALIA.

Batching is facilitated by delaying farrowing in the sows which were mated earliest in the group and inducing farrowing in those mated later in the group. Numerous researchers demonstrated that intramuscular injections of progesterone or feeding altrenogest (MATRIX®) for two to three days, starting several days before the time of normal farrowing, prolongs gestation without consequence.[11] The length of gestation should not be prolonged by more than two days beyond the normal herd average, otherwise heightened incidence of still birth and other complications may occur. Careful use of prostaglandins to induce farrowing two to three days early in sows mated later will help shorten the time range of a batch farrowing, as well as help avoid weekend farrowing.[12]

It may take several litters to get the batches into a tight cycling pattern. Progressively weaning sows at closer and closer intervals will also help to establish a batch by consequently narrowing the breeding timeframe. For example, if you normally wean at four weeks, the first weaning would involve all litters between the ages of three and five weeks. If a fortnight's (two weeks) weaning's are done on the same day, then a month's weaning's result in two batches of breeder females cycling a fortnight apart.[13] Once pregnant, they will then farrow two weeks apart.

One disadvantage of weaning three- to five-week old pigs is that it will result in size unevenness throughout the growing period. Many farms will not have sufficient farrowing crates to allow a delay in weaning. As an alternative, temporary farrowing pens can be made. Sows nursing two- or three- week old piglets can be moved with their litters to temporary pens and nursing can continue until an appropriate time to wean. You will still need to synchronize incoming gilts.

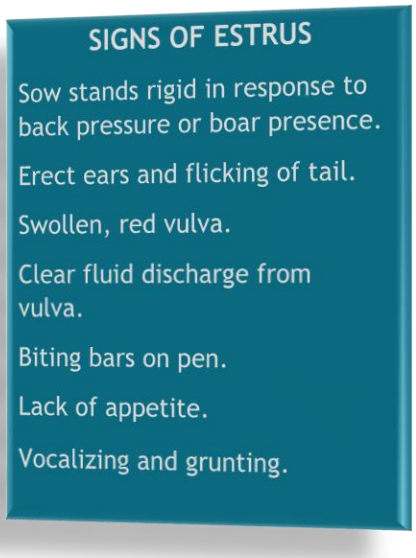
Improved gilt management

Replacement gilts are received into the herd as the cull sows are removed – if sows leave Thursday, gilts arrive on Friday. These incoming gilts need to be synchronized on the same schedule as the sows in that batch. Stimulating gilts to cycle and breed on the second or third estrus is a well-established practice. This may require the use hormone regulators to bring out-of-step gilts into heat for the required service week. Ninety percent of gilts should breed into the first batch; if they don't, these "late-estrus" gilts easily fit into the following breed batch.[14] Following a predictable management routine with correct integration, feeding, and boar exposure makes integration simple.[15]

[11] Kraeling Robert & Webel, Stephen. Current strategies for reproductive management of gilts and sows in North America. Journal of Animal Science and Biotechnology 2015
[12] Armstrong, An Introduction to Batch Farrowing.
[13] Ibid.
[14] Dr. Dave Baumert. Batch Farrowing.
[15] Armstrong, An Introduction to Batch Farrowing.

Estrus, Heat Detection, and Breeding

Estrus should be checked frequently due to the variations in time of ovulation. Estrus normally lasts 24 to 48 hours in gilts and up to 72 hours in sows. Ovulation occurs approximately 38 to 48 hours after onset of estrus. Approximately 90% of sows express estrus three to six days after weaning.[16] Checking estrus more often means ovulation can be better predicted. Sows mated at estrus four to six days after weaning have optimal farrowing rates and greater litter sizes than sows mated later than six days after weaning, as eggs are most viable early on.



Heat detection

The ideal order for detecting heat in the breeding herd is to check gilts first because of their shorter estrus expression. Weaned sows should be done second, as their estrus expression is longer and more easily detected. Opportunity sows (late weaners, not-in-pigs, and aborts) can be checked last as a chance to integrate them back into a group.

When a boar stimulates a sow or gilt with his pheromones and nose-to-nose contact and the female stands to back pressure (solid heat) she is ready to be bred.[17]

Breeding

Ovulation synchronization and single fixed-time Artificial Insemination (AI) facilitate closer farrowing synchronization to improve supervision and reduce stillbirths. If a batch or group of sows are induced to ovulate and then are inseminated in the same hour on the same day, producers can expect that farrowing will occur at about the same time. Recent trials show that the time and variability of farrowing was reduced for sows treated with OvuGel® (stimulates release of luteinizing hormone in weaned sows, leading to ovulation 40-48 hours after) and inseminated via single fixed-time AI compared to contemporary control sows inseminated without ovulation synchronization. Greater than 80% of the sows inseminated with a single fixed-time AI then induced on the same day, farrowed on the same day.[18]

Farrowing, Piglet Care, and Weaning

Batch farrowing reduces variation in piglet age at weaning, and groups routine tasks for efficient use of facilities. Hyper-prolific maternal line females of today commonly have 14 to 16 piglets born alive and piglet pre-weaning mortality ranges from 11 to 24 percent predominantly in the first five days of age.[19] Therefore, there is renewed interest in attendance and assistance at farrowing.

[16] Kraeling, Current strategies for reproductive management.
[17] Sow & Gilt Management Manual, PIC 2015
[18] Kraeling, Current strategies for reproductive management.
[19] Kraeling, Current strategies for reproductive management.

Producers should first check that sows are ready to farrow. They should guarantee correct sow condition, with 18 to 19mm or .70 to .74 inches of back fat, and verify that all proper vaccinations have been done according to schedule.[20]

For groups to farrow closely in a small window of time, induction may be necessary. Sows not farrowing on their own may need to be induced. Induction supplements must be administered no earlier than two days before the expected farrowing based on the average expected farrowing date of the herd. Don't induce before 114 days gestation due to low viability[21] – induction too early will result in low piglet birth weight, increased duration of farrowing and increased stillbirth and born alive mortality rates.[22] Always induce with care, especially sows with a history of farrowing problems.[23] Induction substantially decreases piglet mortality because a high proportion of farrowings will occur during normal working hours when there is better supervision, which provides opportunity to save and cross-foster piglets.

A study found that ninety percent of piglets from induced sows were the same day of age at weaning and were 1.3 days older than those from non-induced sows. In these studies, 92 percent of treated sows farrowed within two days. Allowing pigs to stay in utero an extra two to three days improves birth weight and colostrum antibodies increase in the sow as gestation length increases.

Reduce still births by marking sows that are at risk because they are high parity, over conditioned, or a history with still births.[24] Stillbirth rates increase as parity and litter size increase, but better stockmanship can help limit this. Generally, farrowing supervision and birth assistance include manually delivering piglets when the birth interval becomes longer than 30 minutes, clearing airways of piglets to prevent suffocation, feeding low-viability pigs colostrum or milk replacer orally if necessary, and cross-fostering litters to ensure piglets from large litters consume adequate colostrum.[25]

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[20] Vansickle, Joe. Ten Steps to Successful Farrowing. National Hog Farmer. 15 June 2006
[21] Ibid.
[22] Kraeling, Current strategies for reproductive management.
[23] Vansickle, Ten Steps to Successful Farrowing.
[24] Ibid.
[25] Kraeling, Current strategies for reproductive management.

Piglet care

In batch farrowing, it is more difficult to have nurse sows because farrowing is every two to five weeks. Instead, feed supplemental milk to pigs two or more days old in rescue decks if there are too many piglets.[26] Don't ignore compromised piglets. Instead, give them daily attention to meet their needs. All piglets need a good dose of colostrum, which provides warmth, energy, and important antibodies to boost piglet immunity.[27]

Producers should pay attention to variation between suckling litters, however, due to the closeness in age, most piglets will be about the same size and require the same diet, which helps to improve feed efficiency.[28] Additionally, this allows for more efficient scheduling of piglet processing tasks, like pre-wean vaccinations, and ensures that all piglets get the proper treatments.

Weaning

The recommended age for weaning is dependent on the system of choice but averages from 18 to 25 days (a minimum on 28 days in the EU).[29] Note that pigs younger than 18 days and weighing less than 11 pounds require more feed and care in the nursery and finisher sites.[30] Weaning heavier piglets improves their performance post wean. They have higher average daily gains, lower mortality, and lower production costs. Improve piglet survival by weaning on a Monday so that more personnel are available to attend to sows during the four- to five-day peak period.[31]

The weaning age must best suit the facility and throughput of pigs. The number of available farrowing rooms further influences the weaning age. Commonly, the weaning age is an average of the group, so the "age" may be a few days younger or older depending on the time of birth. For example, if sows are joined over a five-day period, the youngest age at weaning is 26 days, and the oldest is 30 days, if weaning at a 28-day average.[32]

This longer weaning period also allows sows more time to return to their pre-pregnancy size and weight, thus improving subsequent farrowing performance. Every suckled teat sends a hormonal signal to the brain to release low-levels of cycle-inhibiting hormones. When sows are weaned, the inhibition is removed and estrus is triggered.[33] A delayed return to heat may disrupt farrowing programs; this is common in gilts weaning their first litter or sows with poor body condition.[34] To promote quicker milk production shut-down and recovery, sows will need plenty of feed and water.

Improved farrowing house management

Pig health is improved, batch over batch, because the farrowing room is emptied, cleaned, and disinfected completely between farrowings. Allowing for a break in the farrowing room between batches gives time to clean

[26] Ketchum, Ron & Rix, Mark An In-depth Look at Batch Farrowing. National Hog Farmer. 12 Sept 2011
[27] Vansickle, Ten Steps to Successful Farrowing.
[28] Dr. Dave Baumert. Batch Farrowing.
[29] Council Directive 2008/120/EC of 18 December 2008 laying down minimum standards for the protection of pigs
[30] Sow & Gilt Management Manual, PIC 2015
[31] Ketchum & Rix, An In-depth Look at Batch Farrowing.
[32] Roese & Taylor, Batch Farrowing for the Pig Industry.
[33] Sow & Gilt Management Manual, PIC 2015
[34] Armstrong, An Introduction to Batch Farrowing.

and disinfect thoroughly before the next batch of piglets arrives.[35] This removal of suckling piglet populations prevents the ongoing movement of viruses such as Influenza, PRRS, and PEDv. If a group of piglets does contract a disease, by the second wean of a batch the disease is off farm because of improved sanitation and treatment efficacy when piglets are removed at the same time.[36] Cleaner farrowing rooms limit and control disease spread so pre-wean health is greatly improved. Better health early on in life results in decrease wean-to-finish illnesses and mortality.

System Considerations

Producers should evaluate their spacing requirements before they begin the shift to batch farrowing. Are there enough farrowing stalls available? Can the nursery and finisher rooms accommodate the larger number of piglets? Evaluate and recognize the physical limitations of the farm's housing accommodations.

Batching efficiency requires enough breeding sites for allocating one farm to each week of a four-week cycle. So, if four farms are supplying one finisher site, then each farm needs to schedule farrowing during a separate week so that there is a constant supply of piglets to the finisher site.[37] Infrastructure demands don't change much if breeding demands over a group of farms are properly allocated into each week of a four-week cycle. The boar is at a different farm every week (or supplying a different farm). This approach adds value to some of the older, smaller sow farms.[38]

Batching Options

There are several batch scheduling options available, but, *there is no one set method of batch grouping*. Producers are encouraged to use what works best for their facility and staff. The following are examples of how batch farrowing can be scheduled but differences will occur on individual farms due to staffing sizes, facility sizes, geographical location, and farm preferences.

[35] A. Lurette, Modeling batch farrowing management within a farrow-to-finish pig herd.
[36] Dr. Dave Baumert. Batch Farrowing.
[37] Ibid.
[38] Ketchum, Ron & Rix, Mark. How Batch Farrowing Impacts Production.

Three-week Batch Management System:[39] a fixed 21-weeks sow cycle in which seven groups can be inseminated with three-week intervals and farrowing crates are refilled every six weeks. The standard weaning age in this system is 28 days.

Four-week Batch Management System:[40] A fixed 20-week sow cycle in which five groups of sows are inseminated with a four-week interval, and piglets are weaned at approximately 21 days.[41] At weaning, all crates are emptied, cleaned, and disinfected then given a few days of downtime before being repopulated. Sows should be brought in to the crates a few days before expected farrowing.

Five-week Batch Management System: the sow population is divided into four batches, and piglets are weaned at approximately 28 days of age.

Example of Increased Production[42]

A 700-sow farm with 120 farrowing crates, for example, would normally farrow about 30 litters per week and wean 300-plus pigs per week. If the farm converted to a four-week batch management system, they would have five groups of sows, breeding about 142 sows per batch. With a farrowing rate of 85%, they would farrow 120 sows per week. If the farm could wean ten pigs per litter, they could wean over 1,200 pigs per batch.

Example of Pig Flow[43]

A 3000 sow farm on a four-week batch management system will have five batches of 300 pigs. Wean and wash at the same time, then start breeding, then farrow the next batch, and then have 2 weeks over downtime (lactation).

Scheduling

Scheduling tasks in a batch management system is dependent upon the system of choice. However, a few things should universally be considered.

1. Labor should be sufficient to cover all tasks in a timely manner. There should be at least 1 person per every 300 sows during farrowing.[44] Outdoor operations require a smaller person-to-pig ratio, 1 person per 100 sows.
2. Labor should be staggered so crews do not become fatigued by working exceptionally long shifts.
3. Laborers should be trained for or specialize in a specific task. By dedicating personnel to a specific task, they become more efficient, precise, and focused.

If you map out the necessary tasks on to a monthly calendar, you begin to see which activities overlap.

[39] Suls, Leo. Batch Management Production Systems. Pig Progress, Volume 25. Updated 26 January 2011
[40] Ibid.
[41] Dr. Dave Baumert. Batch Farrowing.
[42] Ketchum, Ron & Rix, Mark. How Batch Farrowing Impacts Production.
[43] Dr. Dave Baumert. Batch Farrowing.
[44] Ketchum, Ron & Rix, Mark. How Batch Farrowing Impacts Production.

Sample Calendar

4-Week

CALENDAR MONTH	JANUARY
CALENDAR YEAR	2017
1ST DAY OF WEEK	SUNDAY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
WEAN DAY & WASH	WEAN DAY & WASH	BREED GILTS, WEAN DAY, & WASH	BREED GILTS & WASH	BREED GILTS, +/- FARROW GILTS	BREED GILTS/SOWS & FARROW GILTS	BREED SOWS & FARROW GILTS
8	9	10	11	12	13	14
BREED SOWS & FARROW SOWS/GILTS	BREED SOWS, FARROW SOWS, PROCESS PIGS	FARROW SOWS & PROCESS PIGS	FARROW SOWS, PROCESS PIGS, & CULL SOWS	PROCESS PIGS & RECEIVE GILTS	PROCESS PIGS & RECEIVE GILTS	PROCESS PIGS
15	16	17	18	19	20	21
			LACTATION WEEK			
22	23	24	25	26	27	28
			LACTATION WEEK			
29	30	31	1	2	3	4
WEAN DAY & WASH	WEAN DAY & WASH	BREED GILTS, WEAN DAY, & WASH	BREED GILTS & WASH	BREED GILTS, +/- FARROW GILTS	BREED GILTS/SOWS & FARROW GILTS	BREED SOWS & FARROW GILTS
5	6	7				
BREED SOWS & FARROW SOWS/GILTS	BREED SOWS, FARROW SOWS, PROCESS PIGS	FARROW SOWS & PROCESS PIGS				

Stockmanship

Training farm workers in the art of stockmanship continues to be a challenge for swine farm managers and is of increasing importance as consumers become more interested in humane farm animal care. Pigs frequently display fear of humans and this decreases productivity. Positive, gentle, pig treatment by personnel directly results in better performance. Pigs which displayed a high level of fear of humans had sustained elevation in plasma concentration of corticosteroids associated with poor conception rate and litter size.[45] Personnel should treat sows gently by moving slowly and quietly and eliminate the use of electrical prods.

Personnel should be attentive and observant to limit piglet mortality. Goal should be to wean 85% of piglets born. Aside from disease, more than 50% of piglet mortality in the first two days on life is from the sow laying on the piglets. Minimize environment and management stressors to avoid savaging of piglets.[46]

Conclusion

Batch farrowing can be used to effectively increase piglet livability. It limits disease by limiting how often, if ever, groups of pigs come into contact with each other. It improves task efficiency by tightly scheduling

[45] Kraeling, Current strategies for reproductive management.
[46] Sow & Gilt Management Manual, PIC 2015

activities and procedures to specific, predictable times. It improves piglet weight by allowing for a higher weaning age.

Batching can be versatile and accommodate any facility, large or small. It may take some time to establish batches, but producers frequently an increase in productivity and profit. Always remember, quality stockmanship is at the center of any successful production system.

† VAL-CO uses Matrix® and OvuGel® as an example, not as an endorsement of any particular medication.

VALCO COMPANIES, INC.
2710 Division Highway
New Holland, PA 17557

1-800-998-2526
Info@val-co.com
Facebook LinkedIn