Swine Veterinary Partners

Strategies to Optimize wean age

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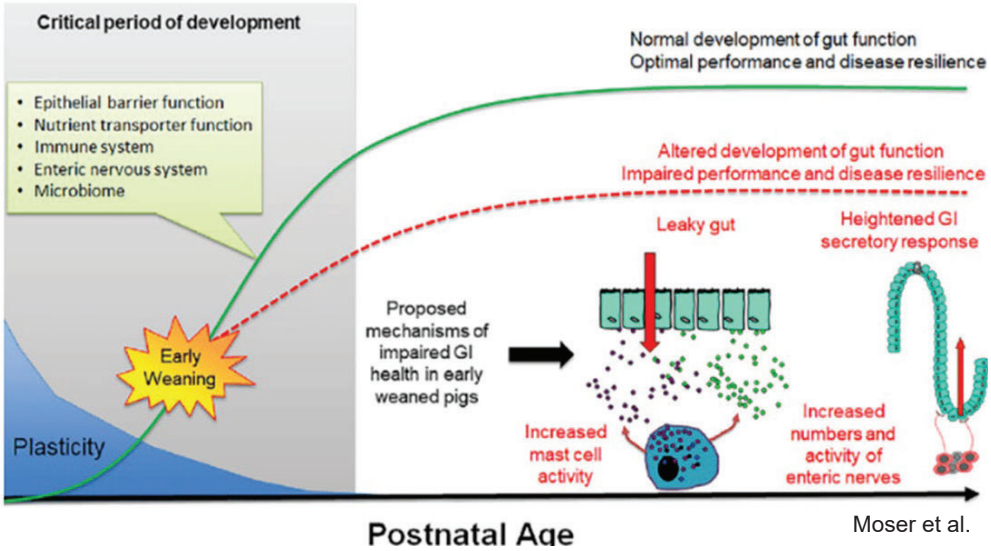
WEAN AGE A SHORT HISTORY

- Naturally, weaning happens gradually around 10 to 12 weeks of age.
- Reduce wean age gradually from 6 weeks to 4 weeks,
  - Acceptable practice in intensive swine production until 1990
  - Two important events happened:
    1. The development of medicated early weaning by
    2. Significant advancements in swine nutrition
- Those two events propelled the rise of Segregated Early Weaning (SEW) as one of the leading production strategies of the 21st century
- Wean age in average as settle between 18-21 days
  - Younger often around 14 days of age

IMPACT OF WEANING AGE ON GI TRACT DEVELOPMENT AND FUNCTION

- Weaning in commercial pig production is one of the most stressful events in a pig's life.
- Weaning is abrupt, occurring between 14 to 28 days of age.
- Sudden separation from the mother
- Drastic dietary change
- Compounded by other stress
- Coincides with declining passive immunity
- All those stresses disrupt the normal development processes of all the GI function

IMPACT OF WEANING AGE ON GI TRACT DEVELOPMENT AND FUNCTION

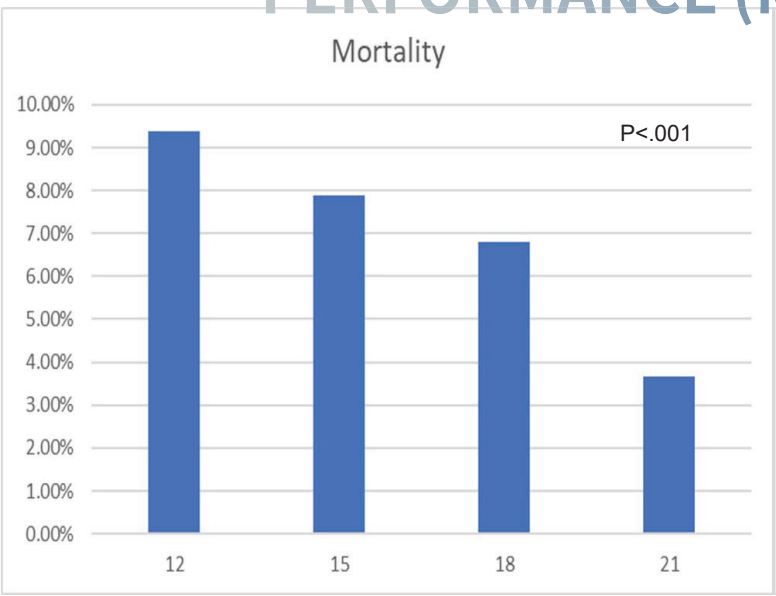


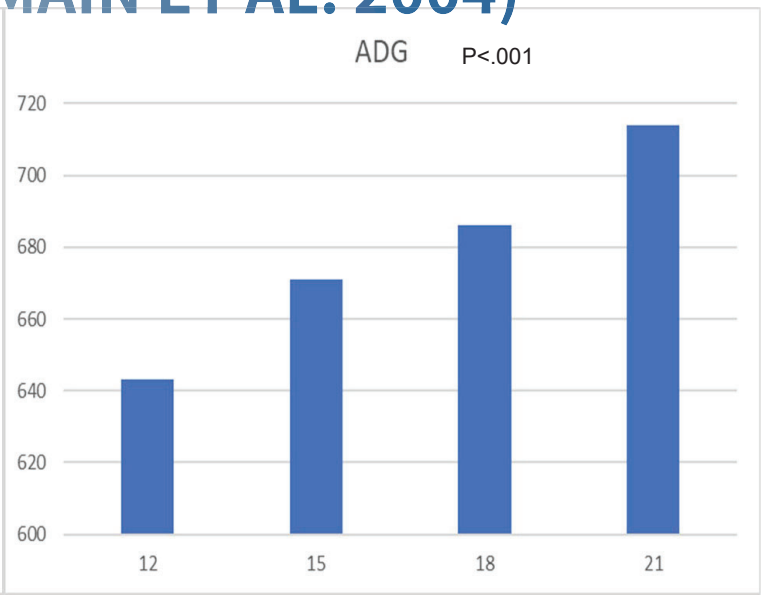
Moser et al.

WEAN AGE IMPACT ON POST-WEANING PERFORMANCE:

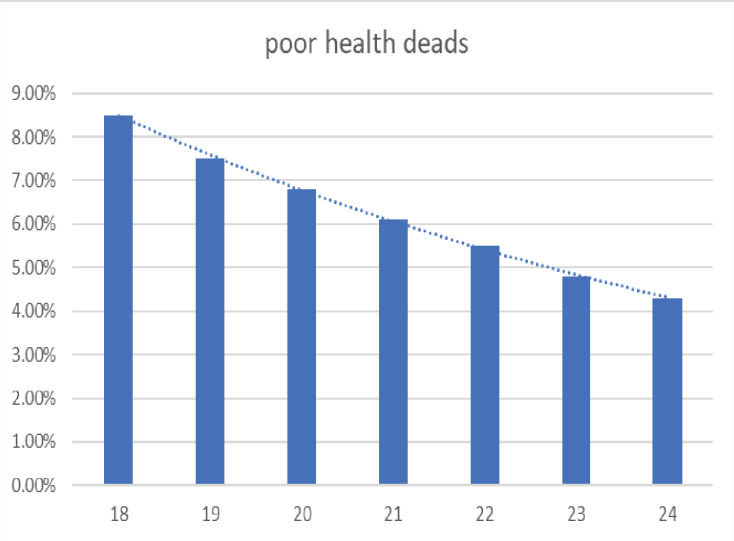
- Main et al. showed linear improvement of both gain and livability in two different trials as wean age increased
- Similar findings were observed in three subsequent control Studies (Smith et al., 2008; Faccin et al., 2020; Faccin et al., 2020b).
- Corroborated by extensive data group analysis (Rosero et al., 2016)
- robust evidence of the impact of wean age on grow-finish performance.

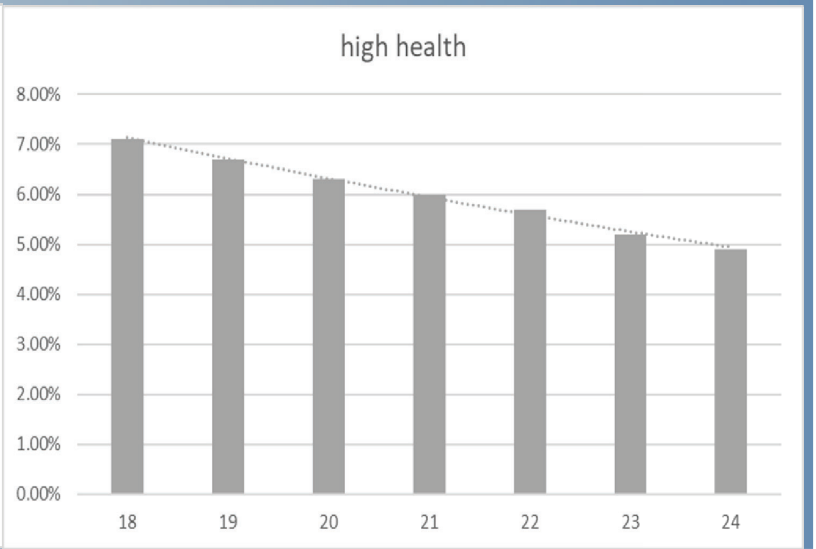
EFFECT OF WEAN AGE ON WEAN TO FINISH PERFORMANCE (MAIN ET AL. 2004)





IMPACT OF WEAN AGER ON MORTALITY F DIFFERENT HEALTH STATUS





Rosero et al 2016

LINEAR IMPROVEMENT ASSOCIATED WITH AN INCREASE IN WEANING AGE

study	Main et al. 2004	Smith et al. 2008	Faccin et al. 2020	Faccin et al. 2020 b
wean age range (days)	12 to 21	15 to 20	18.5 to 24.5	19 t0 28
wean weight gr	257	300	220	250
D 42 postweaning weight KG	0.93	0.62	0.928	0.802
Wean to finish ADG gr/day	9.9		11.1	13
Wean to finish Mortality	0.47%	0.10%		0.77%
WT sold per pig Wean Kg	1.8		0.71	2.21

Feed and other cost

Gestation	390.0 $
Lactation	465.0 $
Prestarter	1,100.0 $
Nursery1	720.0 $
Nursery2	490.0 $
Nursery3	430.0 $
Finisher 1	405.0 $
Finisher 2	380.0 $
Finisher 3	365.0 $
Finisher 4	355.0 $

Sow farm	
New Construction sow farm	$4,000.00
New Construction farrowing crate	$6000.00
Labor cost per sow per year	$ 170.00
Breeding and genetic and med vet cost	$ 185.00
Utilities & repair & maintenance	$130.00
Fix cost (dep & tax)	$275.00
nursery place	
New Construction	$400.00
contract nursery cost day	$ 0.12
Finisher Space	
New Construction	$650.00
Contract finisher cost per day	$0.16

LINEAR CHANGE PER DAY OF AGE/LACTATION

Parameter	Impact per days
Weanto service interval	-.167days
Conception rate	.167%
Fall out rate	-.083%
Total born	0.1 piglet
Stills & mummies	.033%
Preweaning mortality	.167%
Lactation feed intake	.1 kg
Weaningweight	250gr
Quantity of Prestarter Kg	-250gr
Weight at the exit of the nursery (42 days)	800gr
Weanto finish the mortality	-.33%
Weight sold at market	1.75kg

Wean age impact on economics on constant sow inventory

- When these assumptions were incorporated into a partial budgeting model for a farrow-to-finish system,
- the results indicated that increasing weaning age achieved by improving farrowing crate efficiency and expanding crate capacity
  - led to a higher cost of piglet production
    - This increase was primarily attributable to greater lactation feed intake
    - Additional farrowing crates were included, elevated facility costs
- The model demonstrated
  - total farm revenue and revenue per pig increased when the enhanced post-weaning performance of older piglets in the nursery and finishing phases was fully captured
  - 2$ to 4$ per pig on a fix weight model
  - 5 to 10$ per pig on a fix age model

Reduce inventory to increase wean age

- Increase wean pig cost and sow farm revenue significantly by reducing through put
- Can be offset by increasing the number of lbs. produce on the growing side
- Maybe justify if finishing space is limited and market weight subpar
- Economic loser in a fix weight situation

1. What you need to know before you determine your weaning strategies?

- **What is your farm producing?**
  - Isowean feeder or market pigs?
  - If you are selling Isowean piglets Increasing the weaning age will not improve your bottom line
    - unless the buyer is willing to pay you more for an older bigger pig
    - if it will significantly decrease the number of low value animals.
  - If you are retaining ownership of the piglets, you will capture the main value of increasing weaning age.

1. What you need to know before you determine your weaning strategies?

- **Where is your production bottleneck, and can you do something about it?**
  - **Farrowing capacity:**
    - Total number of farrowing crates,
      - The weaning age target
      - The weaning interval
      - The number of *crate open days*.
  - **Total gestation space:**
    - As the industry increasingly transitions toward group housed, total available gestation space is becoming a more critical constraint in overall herd flow and productivity management.
    - Space efficiency % of space occupied
      - Affected by weaning interval

1. What you need to know before you determine your weaning strategies?

- **Total growing pig space:**
  - production system operates under a *fixed-weight* or *fixed-time* model
    - The farm have sufficient or expandable growing space to maintain a constant market weight (*fixed-weight system*)
    - It is limited by housing capacity, such that any improvement in average daily gain (ADG) translates directly into heavier pigs marketed
    - Reduced space availability per pig when more piglets are produced
    - In systems constrained by space, increased pig flow typically results in lighter market weights unless
      - pigs are sold earlier or additional capacity is added
    - Eastern regions tend to operate under fixed-weight models
    - Most farrow-to-finish producers in the Prairie provinces are more restricted by their available grow-finish space.
    - Will keep Quebec VDR out of the discussion for today!

2.What are the options?

- Reducing wean age.
  - Increase litter target while maintaining farrowing crate efficiency.
- Maintain wean age.
  - Status quo
  - Increase litter target maintains wean age.
    - Increase number of crates.
    - Increasing Crate efficiency
- Increase weaning age.
  - Reduce sow inventory.
  - Maintain sow inventory.
    - Increasing de number of crate
    - Increase crate efficiency.

3. Improving Farrowing Crate Efficiency:

- Farrowing crate capacity can be increased in three main ways:
  - Adding additional farrowing crates
  - Reducing weaning age
  - Improving farrowing crate efficiency.
- Enhancing farrowing crate efficiency primarily involves reducing *crate open days (COD)*
  - the number of days a crate remains empty or occupied by a gestating sow rather than nursing piglets.
  - Reducing COD
    - Requires a shift toward a *push system*
    - Farrowing crates are vacated only when needed for incoming farrowing sows.
    - You do not wean to breed!

Farrowing Crate Efficiency:

- The implication of working in a push system is:
  - You wean more than once per week.
  - Your breeding schedule is more flexible.
  - Your sows enter farrowing in just in time manner (with a reduced safety margin).
  - If you have large farrowing rooms those may operate in continuous flow.
  - You wean smaller groups of pigs each time you wean.
  - You reduce wean age variation (imply moving sows between rooms to tight age up).
  - More work!

Impact of improving crate efficiency o

	Wean to breed once a week	Push system twice a week	Push system twice a week
Total crate	400	400	400
Wean age	21	21	24
Crate open days	7	4	4
Crate turn	28	24	28
litter target	100	117	100

Farrowing crate efficiency and Batch

- It is possible to implement a push system even within a batch farrowing structure.
- In such cases, weaning is no longer performed on a fixed day of the week but rather when farrowing crates are required for the next group of sows
- Because the herd still operates under a batch production model, maintaining a consistent overall weaning rhythm remains essential.

Farrowing crate efficiency and Batch

- In a 4-week batch production system using a push approach
  - Weaning would occur on a Monday for one 20-week cycle
  - Then on a Thursday in the following cycle,
  - Returning to Monday in the subsequent 20-week turn.
    - Production cycle of 20.5 weeks, not exactly 20 weeks.
    - As a result, every 40 weeks the breeding week advances by one week

- Recognizing and managing this timing shift is critical, as it directly impacts
  - breeding
  - farrowing
  - Semen ordering schedules.
  - Clear communication of this cycle adjustment with personnel and the semen supplier is essential

4.Adding farrowing crates

- Adding additional farrowing crates represents the most straightforward, yet also the most capital intensive, strategy to increase farrowing capacity.
- Based on current construction costs, the investment required to build new farrowing facilities is approximately
  - $6,000 per crate
  - Assuming a 15-year loan amortized
  - 5% interest
  - cost to increase the weaning age by one day
    - $3.80 per sow per year
    - $0.13 per pig weaned
- Alternatively, if the weaning age is maintained at the current level, the same expansion in farrowing capacity would allow an increase in farrowing targets by approximately 4.5%.

What does facility cost per phase of production a paradigm change in FF model

	Per sow	Pig
Farrow crate	$6000	$460 (13 wean per crate)
Nursery space		$400
Finisher space		$650

Without considering the advantage of improve ADG livability of increasing wean age

Should you add extra finisher or extra Farrowing space??

5. Reducing Wean age or Maintaining Wean age and increasing through put

- **Reducing weaning age:** Current average weaning age is already high (24 days or more)
- **Maintaining current weaning age:** Average weaning age is acceptable (around 21 days or more)
  - Youngest pigs should still be at least 17 days old at weaning
  - Good overall performance livability
- The **farrow-to-wean farm** does not capture the added value of heavier, older pigs.
- There is **excess finishing capacity** available.

5.Reducing Wean age or Maintaining Wean age and increasing through put

- For the sow herd, increasing weaning age offers little benefit if the extra value of heavier pigs is not realized downstream.
- In a **fixed-market-weight system**, older weaned pigs do not necessarily translate into higher total revenue, since the main advantage—heavier market weights—is capped.
- While improved livability from later weaning represents a cost saving, it rarely offsets the overall gain in total throughput achieved by producing more pigs

- **In other words:**

When market weight is fixed, producing **more pigs**—even if slightly lighter—generates **more total kilograms of pork sold**.

6. Increasing Wean Age by Reducing Throughput

- This is a situation we often face in practice. The simplest way to increase weaning age is to **reduce sow inventory**, which inevitably decreases the total number of piglets produced.

- For most **farrow-to-wean farms**, this approach is a **non-starter**, unless there is currently **no market for the piglets** being produced.
- It can, however, make sense in specific cases where **finishing space is limited** and the system can fully capture the benefits of increased **average daily gain (ADG)** and **heavier carcass weights** from fewer pigs.
- Such cases are uncommon; in most scenarios, the **additional weight and revenue per pig** do not completely offset the **loss in total throughput**.

- Alternatively, **selling weaned or feeder pigs** can free up finishing space, allowing for higher carcass weights while maintaining throughput—and even generating **additional revenue**.

6. Increasing Wean Age by Reducing Throughput

- **In other words:**

- Increasing weaning age by reducing sow inventory **only makes economic sense** when the **loss in pig numbers is fully compensated** by the **higher carcass weight and total revenue per pig sold**.

7.Increasing Wean Age While Maintaining Throughput

- Increasing weaning age has **minimal impact on pigs per sow per year (PSY)**, since the slight reduction in litters per sow is largely offset by **higher total born** associated with a longer lactation period.
- If **additional space** is available in breeding or gestation, it may be possible to **increase sow inventory slightly** to maintain a consistent weekly farrowing target.
- By maintaining PSY and adding a few sows, the farm can **sustain or even modestly increase total throughput**.
- In this situation, the improvement in **average daily gain (ADG)** will be captured as **heavier carcass weights**, while keeping the number of pigs marketed stable—or slightly higher.
- This approach generally offers the **strongest economic return**, even in cases where **additional farrowing capacity** must be built to support the higher weaning age.

Increase wean age impact on farm trough put

	Wean at 21 days	Wean at 24 days
Litter target	100	100
LSY	2.39	2.36
Wean per litter	12.28	12.43
PSY	29.37	29.29
Sow inventory	2175	2203
Pig produced	63,878	64526

	current case	Option A Wean age by increasing efficiency	difference	option B Wean age increasing by reducing inventory	difference	Option C increase wean age by adding farrowing crate	difference
barn capacity							
total gestation crate space	900	900	0	900	0	900	0
total gestation pen space	900	900	0	900	0	900	0
total farrowing crate	336	336	0	336	0	382	46
total space	2136	2136	0	2136	0	2182	46
space efficiency in gestation	95%	97%	2%	95%	0%	95%	0%
interval and gestation performance							
batch interval (days)	7	7	0	7	0	7	0
%over farrowing	4%	4%	0%	4%	0	4%	0%
wean age	21	24	3	24	3	24	3
open crate days	7	4	-3	7	0	7	0
wean to service interval	6	5.5	-1	5.5	-1	5.5	-1
conception rate	92.0%	92.5%	0.5%	92.5%	0	92.5%	0.5%

	current case	Option A Wean age by increasing efficiency	difference	option B Wean age increasing by reducing inventory	difference	Option C increase wean age by adding farrowing crate	difference
Performance							
Farrowing rate	89.0%	89.5%	0.5%	89.5%	0.5%	89.5%	0.5%
targer farrow per batch	87.4	87.4	0.0	78.9	-8.5	89.7	2.3
Litter per sow per year	2.39	2.36	-0.04	2.36	0.0	2.36	-0.04
total born	15.5	15.8	0.3	15.8	0.3	15.8	0.30
Stills & mummies	10.0%	10.1%	0%	10.1%	0.0	10.1%	0%
Born alive	13.95	14.20	0.25	14.20	0.3	14.20	0.25
preweaning mortality	12.0%	12.5%	1%	12.5%	0.0	12.5%	1%
wean per litter	12.28	12.43	0.15	12.43	0.2	12.43	0.15
PSY	29.37	29.29	-0.09	29.29	-0.1	29.29	-0.09
average daily lactation itake Kg	6.00	6.30	0.30	6.30	0.3	6.30	0.30
inventory	1898	1928	29	1741	-157.2	1980	81
max inventory	2,029	2,072	43	2,029	0.0	2,073	44
PIG WEAN PER YEAR	55,766	56,460	694	50,996	-4770.3	57,978	2211
wean pig cost	$ 44.37	$ 44.91	$ 0.53	$ 46.55	$ 2.18	$ 45.51	$ 1.14
Wean pig sold	50.00	50.00	$ -	50.00		$ 50.00	$ -
revenu net per pig	$ 5.63	$ 5.09	$ (0.53)	$ 3.45	$ (2.18)	$ 4.49	$ (1.14)
total revenue	$ 2,788,322	$ 2,823,000	$ 34,678	$ 2,549,806	$ (238,516)	$ 2,898,887	$ 110,565
total net revenue	$ 313,773	$ 287,470	$ (26,303)	$ 175,933	$ (137,840)	$ 260,229	$ (53,544)

Conclusion

- Determining the optimal weaning age for a specific production system is a balance between:
  - **Biological benefit**
  - **Economic practicality**.
- The scientific evidence is clear later weaning supports
  - Superior gut development
  - Immune competence
  - Growth performance
  - Livability

- However, translating those biological advantages into measurable financial gains depends entirely on each farm's **production constraints** and **marketing structure** .

Conclusion

- In systems that **retain ownership** of pigs through finishing
  - Increasing weaning age delivers a positive return
  - Improvement in post-weaning performance can be fully captured through heavier carcass weights and reduced mortality.

- Conversely, for **farrow-to-wean operations** selling piglets, the benefits of later weaning are limited unless buyers recognize and pay for the added value of larger, more robust pigs.

Conclusion

- From a system design perspective, the **most economically sound approach is to** Increase weaning age **while maintaining total throughput** .
  - By optimizing farrowing-crate efficiency
    - Adopting a "push" system to minimize open-crate days
    - Adding farrowing capacity
  - Maintaining farrowing target by Modestly increasing sow inventory.
  - Under these conditions, farms can realize both improved pig performance and greater carcass yield without sacrificing pig flow.

- Adding farrowing crate is often a better strategy rather than reducing inventory or adding growing spaces

Conclusion

- Strategies that rely on **reducing sow inventory** to extend lactation
  - Biologically beneficial, are seldom justified economically
  - The revenue loss from fewer pigs generally exceeds the gain from heavier individual carcasses
  - except in rare cases of severe finishing-space limitation.

- Ultimately, optimizing weaning age is not about choosing a single "ideal" number of days, but about aligning **weaning strategy with system bottlenecks, market objectives, and facility capacity**.

- By carefully evaluating where value is captured along the production chain, producers can select the weaning approach that maximizes both pig welfare and farm profitability.

Questions?