

Lactation oestrus: prevention or opportunity



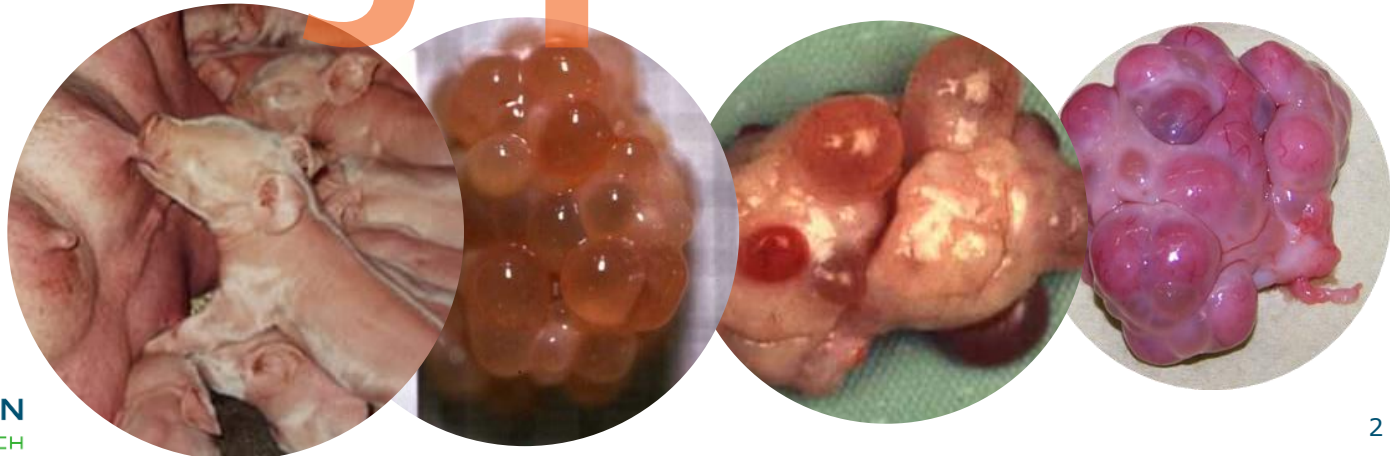
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Magapor
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Prevent, because:

- Lactation oestrus/ovulation causes unpredictable and delayed post-weaning oestrus

Opportunity, because:

- Lactational insemination result in high farrowing rate and litter size and thus tolerates long lactation lengths

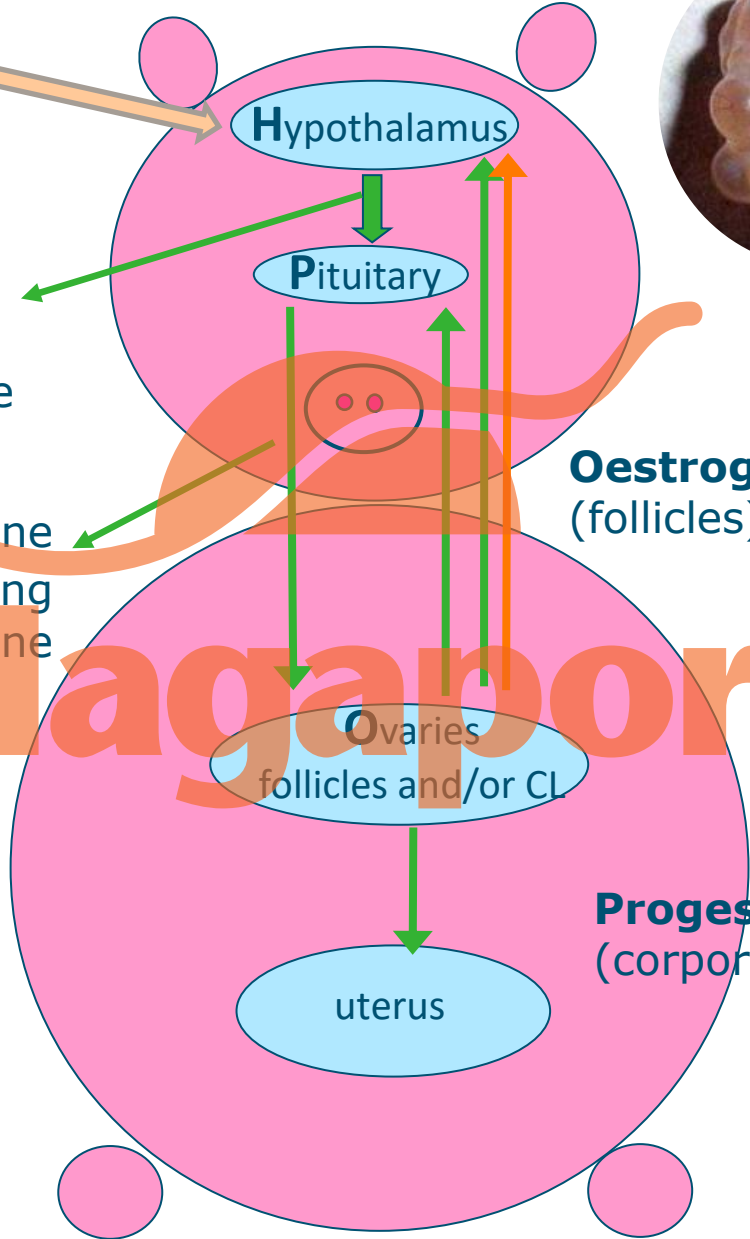


- Lactation (an)oestrus; endocrine background
- (Risk) factors for lactational oestrus/ovulation
- Stimulating lactation ovulation



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Environment
Stress, Energy balance,
Suckling,
Temperature



GnRH -
gonadotrophin
releasing hormone

LH - Luteinizing hormone
FSH - Follicle stimulating
hormone

Oestrogen
(follicles)

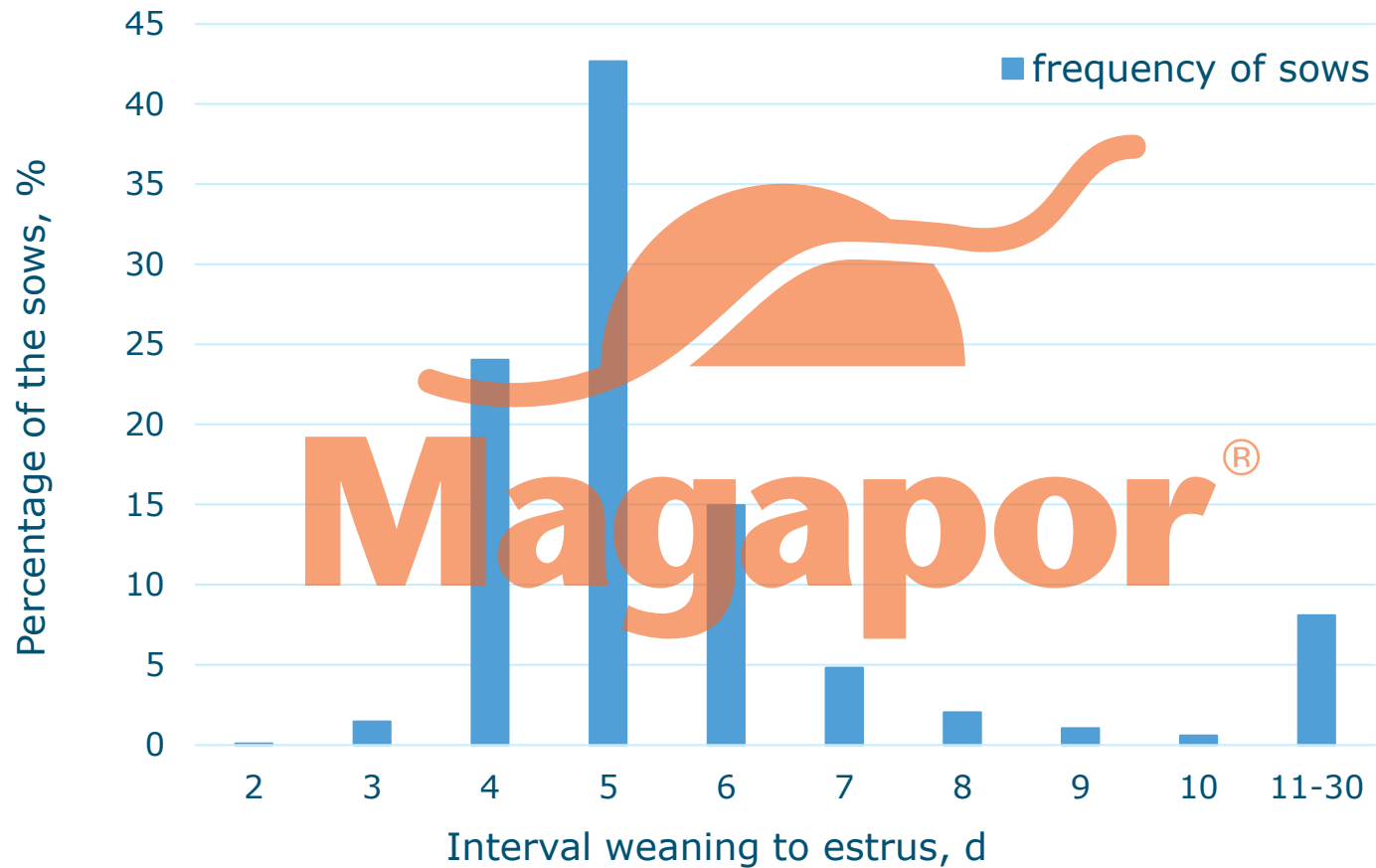
Progesterone
(corpora lutea)

HPO-axis

Feedback:
Positive
Negative

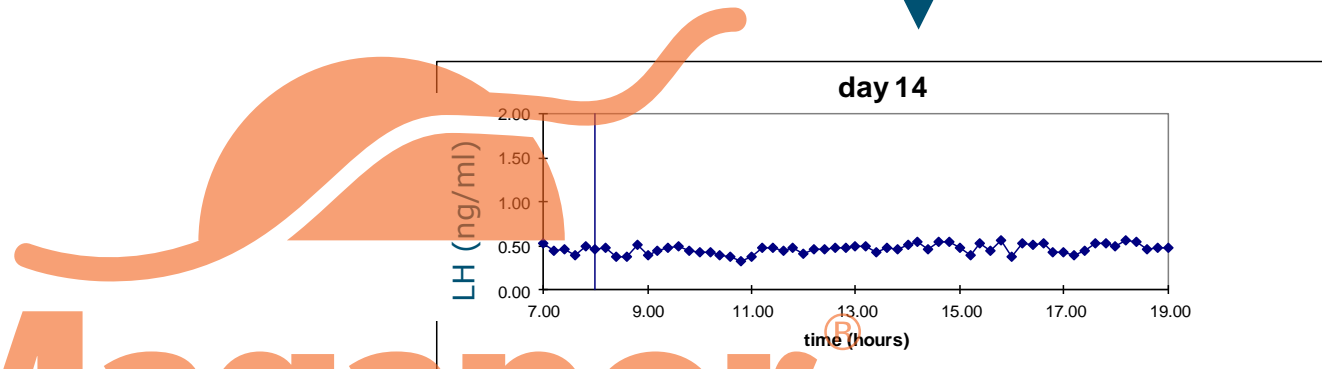


Sows: lactation anoestrus



Steverink et al., 1999

Lactation anoestrus



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no follicle
growth



Weaning

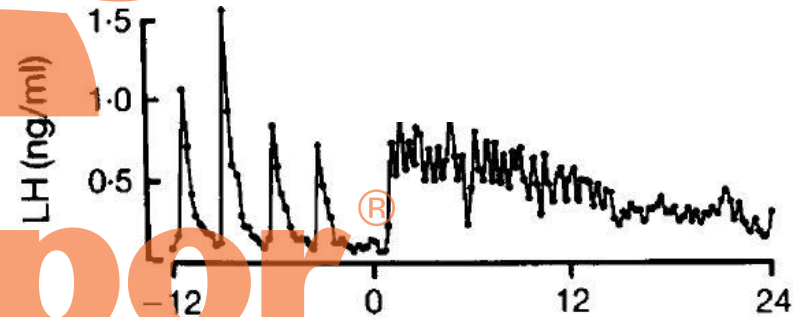
~~Prolactin~~
~~EOR~~



GnRH ↑



LH/ FSH ↑



follicle growth



oestrus



LH profiles

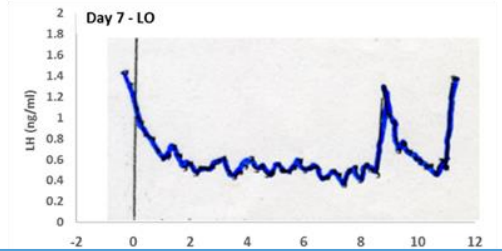
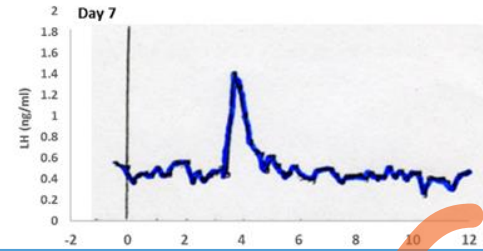
Ovulation time

Day 5 post-weaning

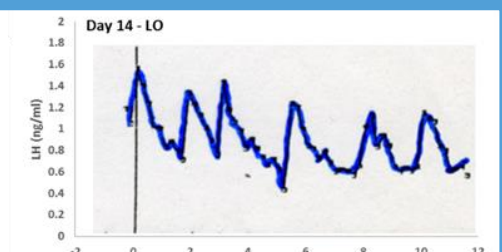
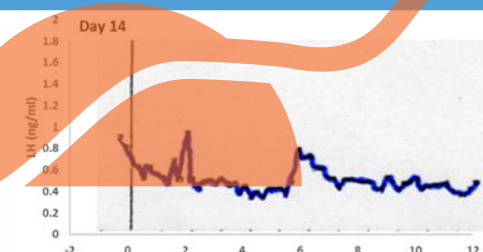
Lactation*

Sampling day

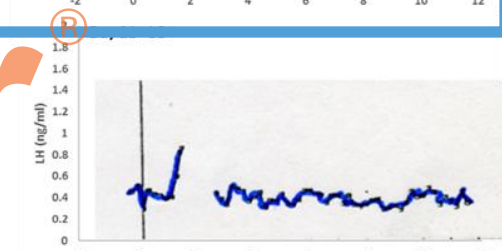
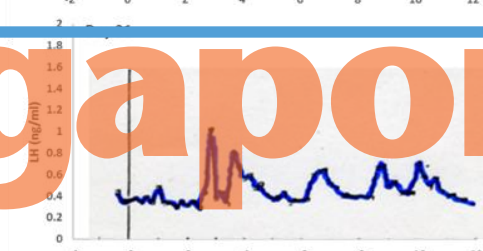
Day 7



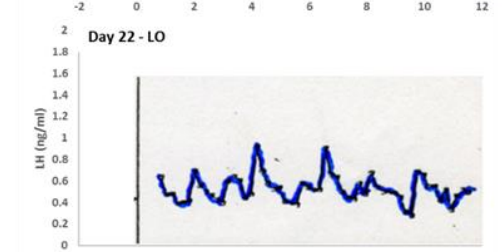
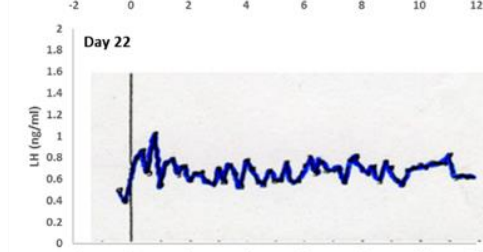
Day 14



Day 21



weaning



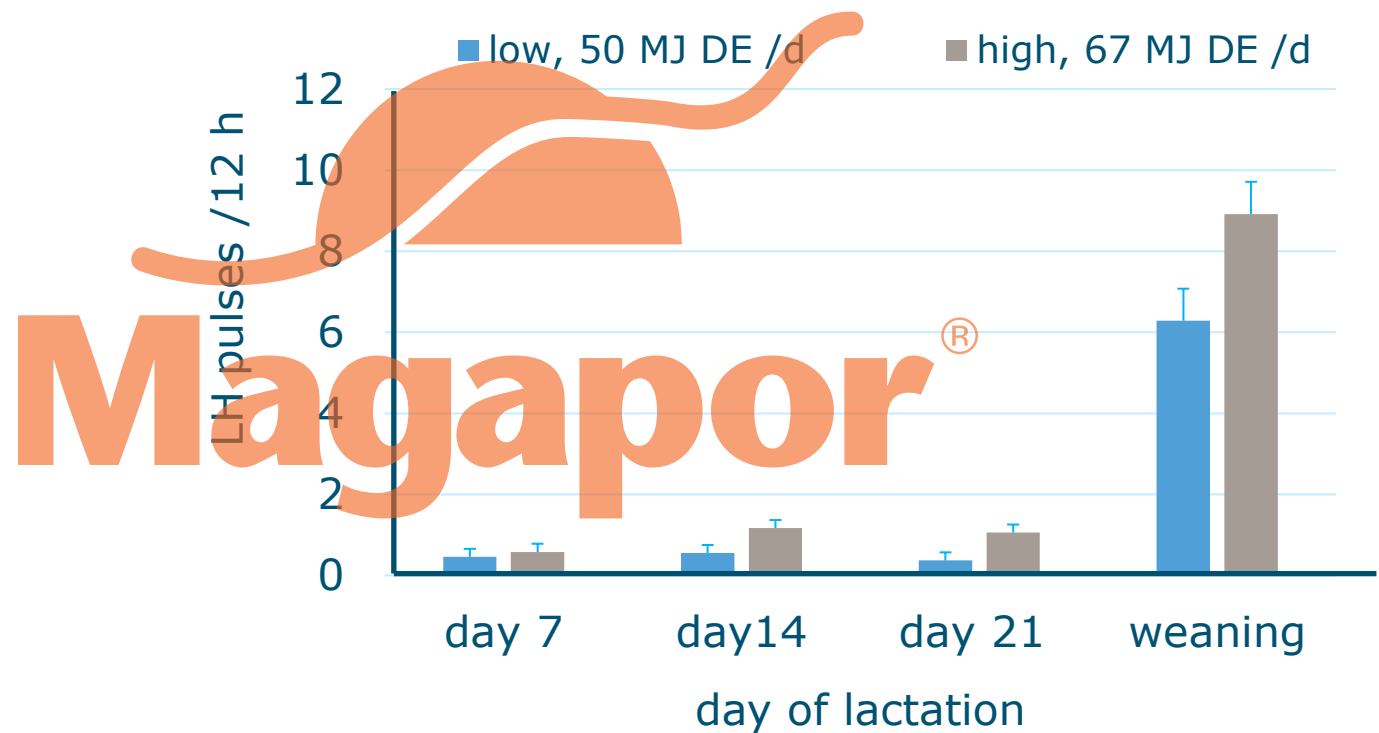
*Corpora lutea at day 2 post-weaning

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Time (hours)

Factors affecting LH

1. Energy balance
2. Suckling intensity



Brand et al., 2000

'Risk factors' for lactation ovulation

- Low lactation weight loss
 - High **parity**
 - Low **litter size**
 - High **feed intake**
 - Low **milk production**
 - udder problems, sick, vaccination?
- Low suckling intensity
 - Long **lactation length**
 - Low litter size
 - Low **vitality of** piglets
 - Piglet **vaccinations**
- Disturbances/restlessness in farrowing room

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- Analyse weaning-to-oestrus intervals
 - Sows with oestrus at $>10 - 20$ d post-weaning
 - Check e.g. parity, litter weight at weaning
- Ovarian ultrasound e.g. 4-8 days after weaning
- Analyse serum progesterone



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Test rápido de ELISA para la determinación cualitativa en la granja de progesterona en sangre

	Cerdas							Controles
	1	2	3	4	5	6	7	
A								Control 1 (<2,5 ng/ml)
B								Control 2 (>5 ng/ml)



(Falceto, 2015)

Courtesy of Prof Falceto



Lactational oestrus in practice?

Ovarian status after weaning

		exp 1	exp 2	exp 3
Day 3	Corpora Lutea	7.3%	2.0%	0%
	In oestrus	2.6%	3.0%	0.7%
Day 3-8	Oestrus+ovulation	83.4%	94%	85.5%
Day 8	Cystic ovaries	3.1%	1.0%	-
	Silent oestrus	2.6%	-	-
	Inactive ovaries	1.0%	-	13.8%

Soede, 1996, unpublished results

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Lactational oestrus in Australia

- **31%** (Downing et al., 2012 (in van Wettere et al., 2017))
- **16%** (Terry et al., 2014)


Lactation ovulation on a Dutch sow farm

- 500 sow farm, lactation length **30 days**
- Rectal ultrasound – full grown corpora lutea on the ovaries - 8 days post-wean

	Lactation ovulation	Post-weaning oestrus
Sows (n)	19	45
Parity	6 ± 0.5	6 ± 0.4
Backfat at entry (mm)	11.7 ± 0.6	12.0 ± 0.5
Backfat loss (mm)	2.4 ± 0.4	1.1 ± 0.3
BW loss, %	3.7 ± 0.9	6.4 ± 0.1
Litter size after crossfoster (n)	13 ± 0.5	12 ± 0.3
Litter size at weaning (n)	12 ± 0.4	12 ± 0.3
Litter weight at weaning (kg)	74 ± 3	75 ± 2
ADG piglets, g	195 ± 8	200 ± 5

Median ± se

Courtesy of Pieter Langendijk and Kristi Ernst, TrouwNutrition, 2024

- Focus on sows 'at risk'
 - Low weight loss
 - Low suckling intensity
 - Search for general disturbances[®]
- 
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Intermezzo: post-partum oestrus

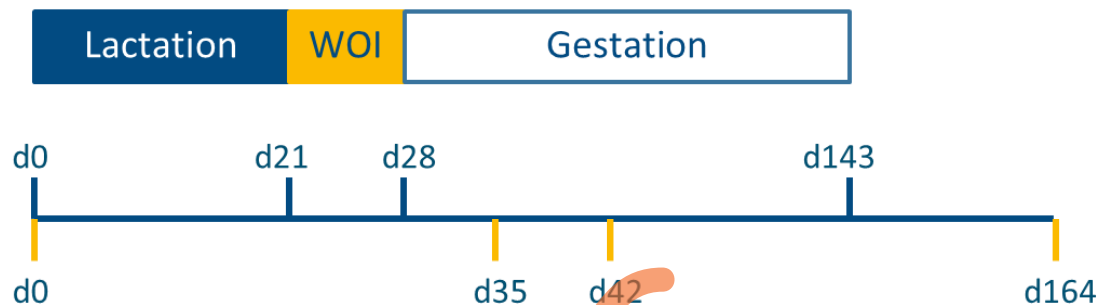
- Oestrus at 1-3 d from farrowing
- No ovulation!
- Occurrence:
 - related with high backfat
 - No effect on piglet mortality
 - Possibly related with high pre-partum oestrogen

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Souren et al., 2005

Benefit of lactational inseminations?

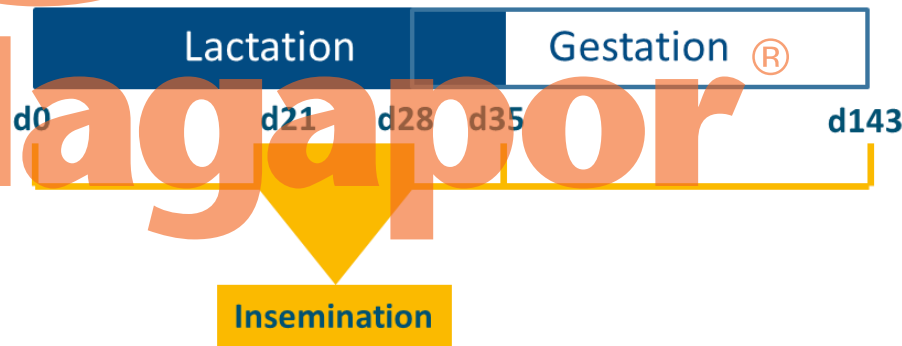
Conventional:



Extended lactation:



Lactational insemination:



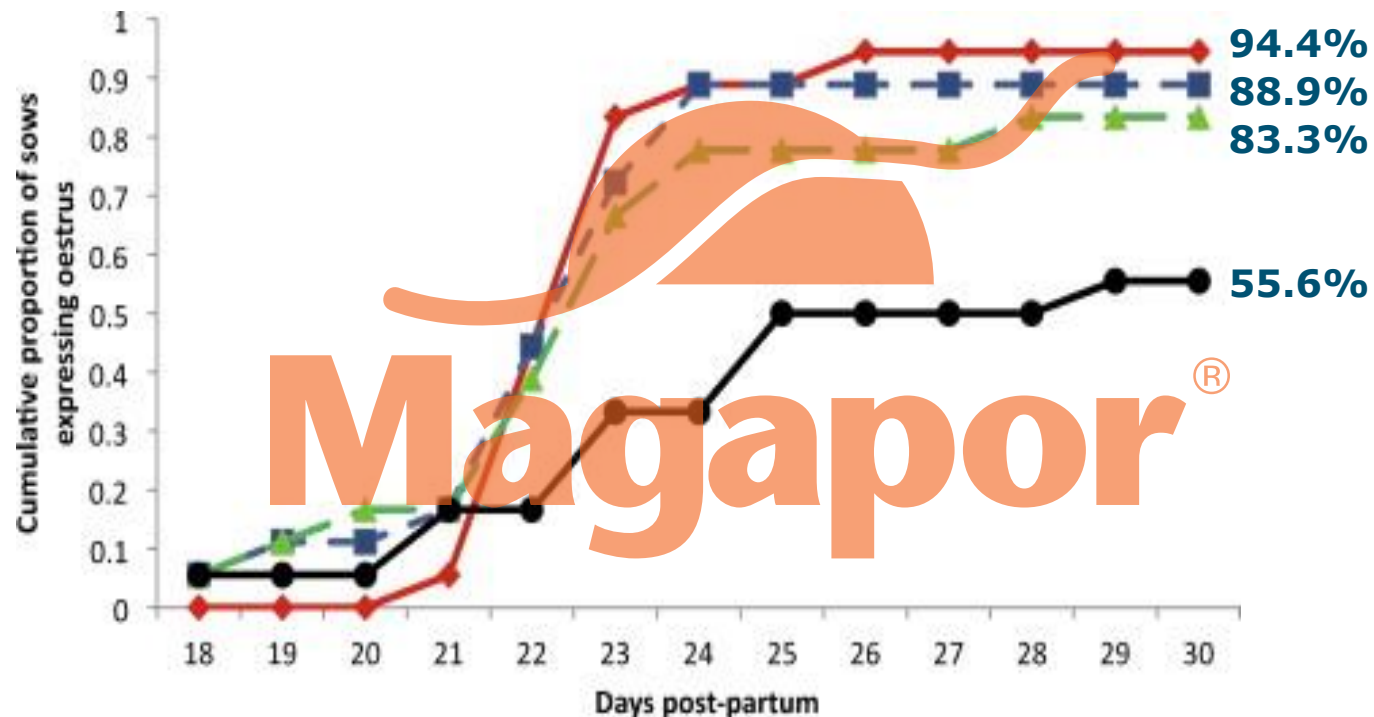
Challenge: to develop strategies which result in **rapid** and **synchronous** lactation ovulation in **>90% of sows**, **large subsequent litter sizes** and are can be **implemented commercially**

Stimulate GnRH release:

1. Provide boar contact
2. Reduce suckling intensity
 - Split weaning: permanent removal of a portion of the litter
 - Interrupted suckling: daily, temporary separation of sow and litter

Lactation oestrus: split weaning - 2013

Day 18: Oestrus stimulation by daily boar contact in detection-mating-area (**black**), and additionally a reduction in litter size from **10**, leaving **8, 5 or 3** piglets.



NB Split weaning in P1 needs reduction to about 5-6 piglets (Matte et al., 1992)

Lactation insemination: split weaning - 2024

Boar contact + Split weaning (leaving 7 of the 11 piglets) at either Day 18 or at lactation oestrus

	Control	SW 7 at Day 18	SW 7 at lactation oestrus
Sows (n)	22	21	16
Weaned ¹ piglets (n)	10.8 ±0.1	7.0 ±0.1	7.0 ±0.1
Weaned ¹ piglet weight (kg)	9.5 ±0.4	10.7 ±0.5	10.1 ±0.4
Lactation oestrus (%) ²	68%	76%	All = treat
Pregnancy rate Day 30 (%)	60%	94% [®]	81%
Ovulation rate (corpora lutea, n)	23.5 ±1.5	22.2 ±1.2	23.3 ±1.1
Embryo survival rate (%)	56.4 ±5.0	73.7 ±4.2	49.5 ±3.9
Embryo weight (g)	1.39 ±0.06	1.64 ±0.05	1.60 ±0.05

¹ Weaning at Day 30-37 (at least 10 days post-mating)

² Including sows already in oestrus at Day 18

- Boar contact + split weaning at Day 18 of lactation in Australia:
 - High percentage of lactational ovulation (76%)
 - increased pregnancy rate and embryo survival rate with insemination during lactation

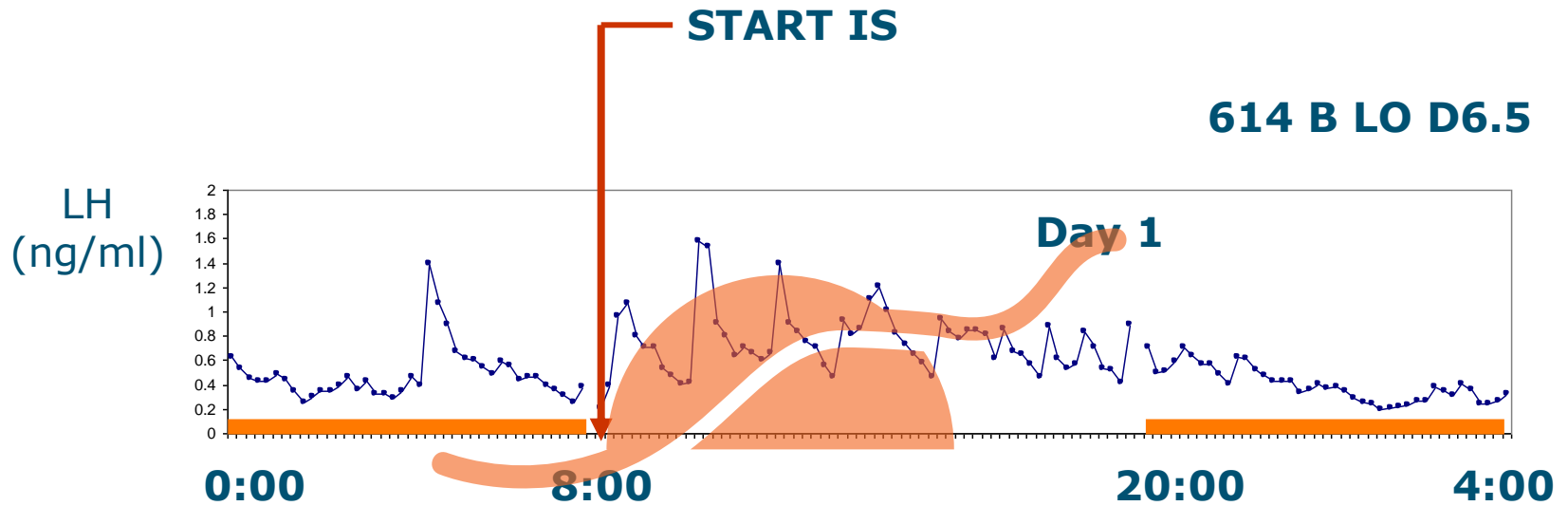
- But how about sows with high litter size??[®]
 - Moment of split weaning?
 - Number of piglets remaining?

Intermittent / interrupted suckling

- Starting at day 14 – 21 - 28 d
- No suckling for 10-12 h per day
- Weaning after 1, 2, 6 weeks



LH secretion during IS regime



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period of suckling



Oestrus and ovulation in IS regimes

	Genetic line	Onset IS	Oestrus (<7days)	Ovulation (<8days)
Exp 1*	Topigs40	D14	83% (10/12)	83% (10/12)
Exp 2*	Topigs40	D14	100% (14/14)	93% (13/14)
Exp 3*	Topigs40	D14	67% (20/30)	73% (22/30)
		D21	83% (19/23)	87% (20/23)
Exp 4*	Topigs20	D14	34% (11/32)	28% (9/32)
Exp 5	Topigs20	D19	50% (20/40)	50% (20/40)
		D26	61% (24/41)	61% (24/41)

NB No boar contact

*Multiparous sows

Exp 5: 23% oestrus in P1 sows and 68% in >P1

Gerritsen et al., 2008/9, Langendijk et al., 2008/9 and Soede et al., 2009

■ Treatments

- Intermittent suckling from d 19 (1 or 2 wks) or d 26 (1 wk)
- Fertility:

Lactation oestrus	no	yes
Percentage of sows	46% (51/133)	54% (72/133)
Onset oestrus	5.9±0.7 d	5.0±0.1 d
Farrowing rate	88%	80%
Litter size	14.7±0.6	15.2±0.5

Conclusion Intermittent Suckling

■ 'Normal' oestrus and ovulation

- Depending on onset (> day 19), parity (>1), boar contact, genetics
- Complete separation from piglets improves results

■ Pregnancy rate and litter size

- Comparable to post-wean oestrus, if:
 - IS starts at ~3-4 wks of lactation

■ But: (too) much labour involved

Group housing during lactation

5 sows + piglets. Sows farrow in own farrowing pen, always access to group. Piglets grouped at Day 10. Wean at 7(-9) weeks.



■ Management

- **Week 5**: IS 10 h per day, sows to separate room with **boar** (oestrus stimulation and insemination)
- **Week 6 onward**: sows visit the **separate** room voluntarily

■ Fertility

- Oestrus + ovulation wk 5: 68%
- Oestrus + ovulation wk 6: 14%
- Farrowing rate: **93%**
- Litter size: **17.8±0.6**



■ Lactation oestrus/ovulation

● Occurrence -Prevention

- Analyse weaning-to-oestrus intervals + use ultrasound or progesterone analyses
- Risk factors: low sow weight loss, low suckling intensity (piglet vitality)

● Can be an opportunity!

- Lactational inseminations give good fertility
- In systems aimed at longer lactation lengths
- For higher parity sows?
- But... need higher oestrus rates

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THANKS
GRACIAS
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